The Trees of North-Eastern America

I.

THE TREES OF NORTHEASTERN AMERICA

II.

THE LEAF COLLECTOR'S BOOK

III.

THE SHRUBS OF NORTHEASTERN AMERICA

(In preparation)

THE TREES

OF

NORTHEASTERN AMERICA

ILLUSTRATIONS FROM ORIGINAL SKETCHES

BY

CHARLES S. NEWHALL

With an Introductory Note by

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I said I will not walk with men to-day,
  But I will go among the blessèd trees,—
Among the forest trees I 'll take my way,
  And they shall say to me what words they please.

And when I came among the trees of God,
  With all their million voices sweet and blest,
They gave me welcome. So I slowly trod
  Their arched and lofty aisles, with heart at rest.

Then all around me as I went,
Their loving arms they lightly bent,
And all around leaf-voices low
Were calling, calling soft and slow.

* * * * * * *

I could not fail to know
The words they whispered so,
Nor could I onward go
From words so sweet and low.

—From *The Trees.*

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PREFACE.

"C——, if you and I were to meet a man on the street and ask him his name, he could tell us. I wish a tree could do as much. Here are splendid specimens all around us, and I don't know one of them."

"Get a book that will help you."

"I cannot find such a book. I can find no book which, in simple fashion, will so describe the tree, from its foliage and bark and style, that I can recognize it."

"Then I will make one for you."

The trees described in the following pages include all the native trees of Canada and the Northern United States east of the Mississippi River. Mention has also been made of the more important of the introduced and naturalized species. The work has been so arranged that any given specimen can be readily found by help of the GUIDE on page 1.

My chief authority for the geographical distribution of the species is Sargent's report in the Tenth Census

of the United States; for the scientific nomenclature, Nath. L. Britton, E.M., Ph.D.

I am greatly indebted to Professors Thomas C. Porter, of Lafayette College, and N. L. Britton, of Columbia College, for valuable aid and suggestions; also to Rev. S. W. Knipe, of Oceanic, N. J.

INTRODUCTORY NOTE.

COLUMBIA COLLEGE HERBARIUM,
NEW YORK, *May* 12, 1890.

DEAR SIRS:—I have been interested in glancing over the manuscript of Mr. Newhall's book on our native trees, and am much pleased to learn that it is to be published. There is great need of such a popular work. It will do much good in supplying information to our people about some of the common things around them, and this in an attractive manner.

Yours very truly,

N. L. BRITTON.

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GUIDE.

For explanation of all terms see glossary at end of book.

Leaves, simple:*

- alternate
  - edge entire. Go to *I* under A
  - " toothed. " *II* " A
  - " lobed
    - Lobes, entire. Go to *III (a)* under A
    - Lobes, toothed. " *III (b)* " A
- opposite
  - edge entire. Go to *I* under B
  - " toothed. " *II* " B
  - " lobed
    - Lobes, entire. Go to *III (a)* under B
    - Lobes, toothed. " *III (b)* " B
- indeterminate. Go to *I* under C

Leaves, compound:

- feather-shaped
  - alternate, edge
    - entire. Go to *I* under D
    - toothed. " *II* " D
  - opposite, edge
    - entire. Go to *I* under E
    - toothed. " *II* " E
- hand-shaped
  - opposite, edge toothed. Go to *I* under F

*NOTE.—The leaflets of a compound leaf can be distinguished from a simple leaf by the absence of leaf-buds from the base of their stems.

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NOTE.—Names in *italics* are given also under another division.

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DESCRIPTION OF TREES.

NOTE 1.—Those species are considered trees (in distinction from shrubs) which, as the rule, spring from the ground with a single branching trunk.

NOTE 2.—The arrangement of the illustrations and descriptions under each section is according to the natural order of the genera.

NOTE 3.—In using the guide and the following leaf-illustrations it should be remembered that leaves from vigorous young sprouts are not usually the best specimens. It is seldom that two leaves, even upon the same mature branch, exactly agree; but they follow the type, while often the younger growth varies from it.

NOTE 4.—When describing the trees, items that are specially helpful in determining the species are given in *italics*.

TREES WITH SIMPLE LEAVES

LEAVES ALTERNATE

(EDGE ENTIRE)

A I

Genus MAGNOLIA, L. (Magnolia.)

From "Magnol," the name of a botanist of the seventeenth century.

Fig. 1.—Cucumber Tree, Mountain Magnolia. *M. acuminàta, L.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long oval. *Apex*, pointed. *Base*, pointed.

Leaves, five to ten inches long, thin, dark green above; green beneath and slightly downy; growing along the branch and not simply in a cluster at its end.

Bark, dark and rough.

Flowers, three to six inches across, bluish or yellowish-white, abundant and fragrant. May, June.

Fruit, in a cylinder-shaped bunch, two to three inches long, and somewhat resembling a small cucumber.

Found, in rich woods from Western New York to Southern Illinois and southward, and in cultivation. Its finest growth is in the southern Alleghany Mountains.

A tree sixty to ninety feet high, with a straight trunk and rich foliage. The wood is durable, soft, and light. Used for cabinet-work, for flooring, for pump-logs, and water-troughs. As in other magnolias the juice is bitter and aromatic.

Fig. 2.—Sweet Bay, Swamp Laurel, Small Magnolia. *M. glauca, L.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long oval or slightly reverse egg-shape. *Apex*, slightly blunt-pointed. *Base*, pointed.

Fig. 1.—Cucumber Tree. (M. acuminàta, L.)
Fig. 2.—Sweet Bay. (M. glauca, L.)
NATURAL SIZE.

Leaf, about three to six inches long, thick and smooth; dark green and polished above; white below; the middle rib green and distinct; the side ribs slight and indistinct.

Bark of trunk, smoothish, light gray, aromatic and bitter.

Flowers, large (two to three inches wide), white, at the ends of the branches, very fragrant. June, July.

Fruit, bright red berries, at first in small cone-like clusters, then hanging by slender threads. September.

Found, in swampy ground, from Massachusetts southward, usually near the coast.

A small tree (often a bush), four to twenty-five feet high, or higher southward, where its leaves are evergreen. All parts of the tree (and it is the same with the other magnolias) have an intensely bitter, aromatic juice, which is stimulating and tonic.

Fig. 3.—Umbrella Tree, Elkwood. *M. tripètala, L.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long oval or slightly reverse egg-shape. *Apex*, short, sharp-pointed. *Base*, pointed.

Leaves, twelve to thirty-six inches long, six to eight inches wide; rather dark green above; lighter beneath; silky when young, but soon smooth; growing in clusters at the ends of the branches.

Bark, smoothish and light.

Flowers, seven to eight inches across, at the ends of the branches, white, and fragrant. May, June.

Fruit, in a cylinder-shaped bunch, four to five inches long, and rose-colored as it ripens.

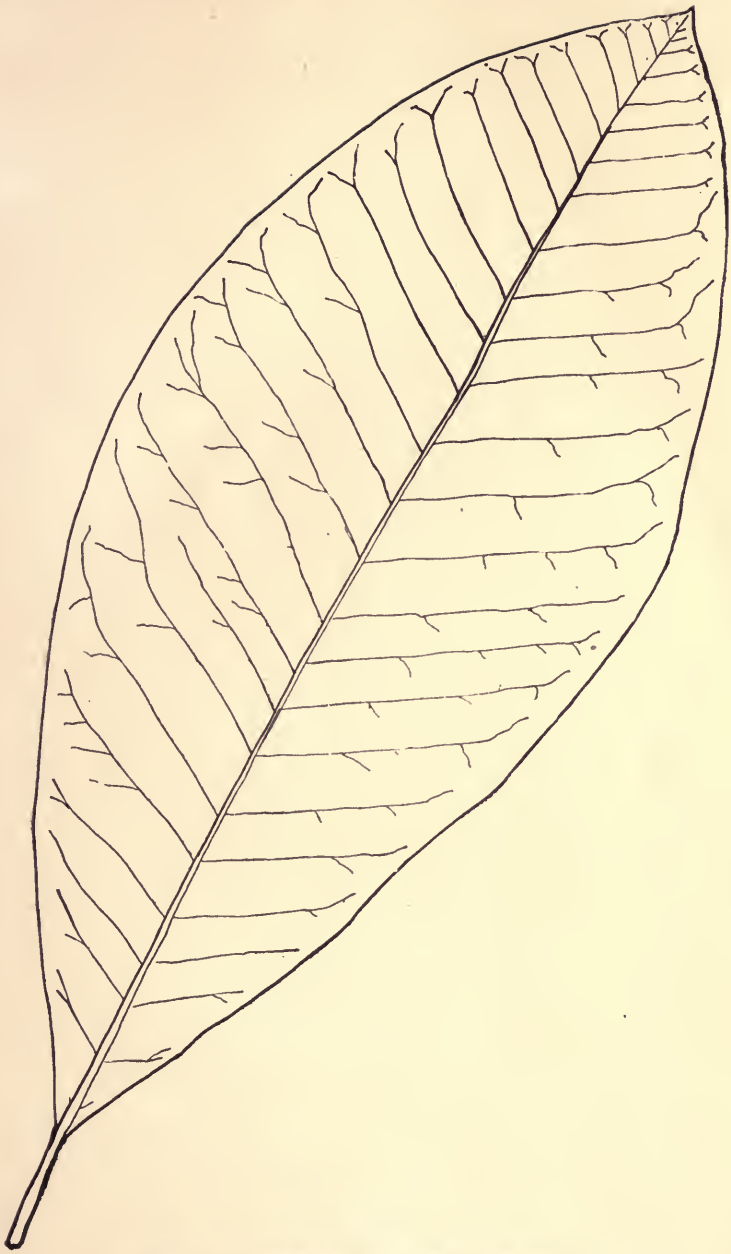

Fig. 3.—Umbrella Tree. (M. tripètala, L.)
ONE THIRD NATURAL SIZE.

Found, in Southeastern Pennsylvania and southward along the Alleghany Mountains, and in cultivation.

A tree twenty to thirty feet high, with irregular branches, and light, soft wood. As in other magnolias the juice is bitter and fragrant.

Genus ASÌMINA, Adans. (Papaw.)

Fig. 4.—Papaw, Custard Apple. *A. trìloba (L.), Dunal.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long, reverse egg-shape. *Apex*, pointed, in small leaves, sometimes rounded. *Base*, taper-pointed or slightly rounded.

Leaf, five to ten inches long, thin, rusty downy when young, soon becoming smooth and polished.

Bark, silvery-gray, smooth and polished; young shoots downy.

Flowers, one and a half inches wide; dark to light, in drooping clusters, appearing with the leaves. March, April.

Fruit, about three inches long by one and a half inches thick, egg-shape, yellow, about ten-seeded, fragrant, sweet, and edible. October.

Found, from Western New York to Southern Iowa and southward.

A small tree of unpleasant odor when bruised, ten to twenty feet high (or often only a bush) and densely clothed with its long leaves.

Fig. 4.—Papaw. A. triloba (L.), Dunal.
LEAF, NATURAL SIZE. FRUIT, TWO THIRDS NATURAL SIZE.

Genus CERCIS, L. (Red Bud.)

From a Greek word meaning "shuttle," because of the shuttle-shaped pod.

Fig. 5.—Red Bud, Judas Tree. *C. Canadènsis, L.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, round heart-shape. *Apex*, tapering and rather blunt, sometimes with a short bristle. *Base*, heart shape.

Leaf-stem, smooth and swollen at each end into a sort of knob.

Leaf, usually about four to five inches long and wide; rather thin; smooth above and below; with seven prominent ribs radiating from the end of the leaf-stem.

Flowers, reddish, acid, usually abundant in small clusters along the branches; appearing before the leaves. March to May.

Fruit, a small, many-seeded, flat pod, winged along the seed-bearing seam. *Seeds*, reverse egg-shape.

Found, in rich soil, Western Pennsylvania, westward and southward. Common in cultivation.

A small and fine ornamental tree, with long, flat-leaved branches.

The name "Judas tree" is traditional. "This is the tree whereon Judas did hang himself, and not the elder tree, as it is said."

Genus NYSSA, L. (Sour Gum.)

From the name of a water nymph, because of the location of the original species.

Fig. 6.—Sour Gum, Black Gum, Pepperidge, Tùpelo. *N. sylvàtica, Marsh.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, oval or reverse egg-shape. *Apex*, pointed. *Base*, pointed.

Leaf-stem, slightly hairy when young.

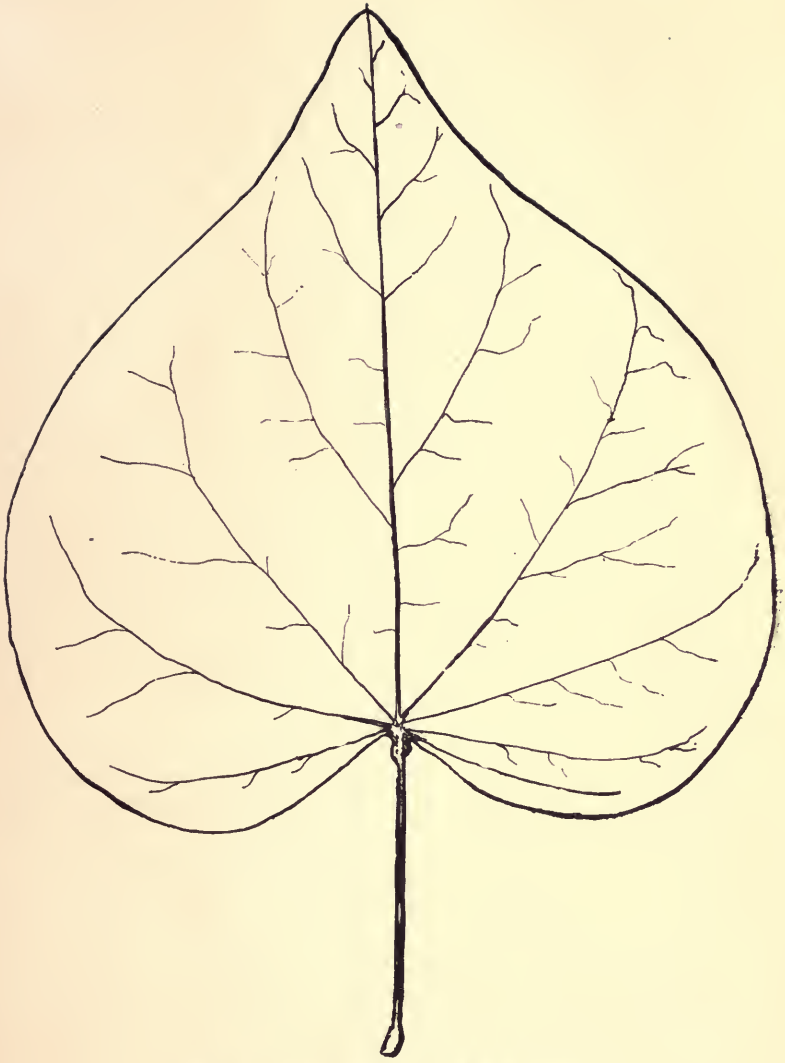

Fig. 5.—Red Bud. (C. Canadènsis, L.)
NATURAL SIZE.

Leaf, two to five inches long; usually about half as broad; dark green and very shining above, especially when old; light green and shining below; thick, tough, and firm. Middle rib slightly hairy when young; side ribs rather indistinct and curved.

Bark, grayish and often broken into short sections.

Fertile flowers, small, in clusters of three to eight on slender stems. April, May.

Fruit, nearly one half inch long; bluish-black when ripe; egg-shape or oval; acid and rather bitter until "frosted." *Stone*, oval, somewhat pointed at each end, slightly flattened, and with three or four blunt ridges on each side. September.

Found, from Southern Maine to Michigan, and southward to Florida and Texas.

A tree twenty to forty feet high (larger southward), with flat, horizontal branches. The wood, even in short lengths, is very difficult of cleavage, and so is well fitted for beetles, hubs of wheels, pulleys, etc. Its leaves are the first to ripen in the fall, changing (sometimes as early as August) to a bright crimson.

I was commenting, one day, to a reverend doctor and professor on the frequent reference to this tree in stories and anecdotes of Southern life, when he fluently quoted:

"Possum up a gum-tree,
Cooney in de holler,
Nigger in de corn-field,
Don't yer hear him holler."

A better version changes the last two lines:

"Possum up de gum-tree,
Cooney in de hollar.
Fetch him down, little boy,
Give yer half a dollar."

The professor added the explanation that the opossums climb the tree in search of its fruit.

Fig. 6.—Sour Gum. (N. sylvàtica, Marsh.)
NATURAL SIZE.

Genus DIOSPŸROS, L. (Persimmon.)

From two Greek words meaning fruit of Jove.

Fig. 7.—Persimmon. *D. Virginiàna, L.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long oval or long egg-shape. *Apex*, pointed. *Base*, pointed or rounded.

Leaf, three to five inches long, thickish; dark and smooth, usually shining, above; below dull, with the ribs curved and irregular and minutely downy. On the upper surface the ribs are quite indistinct, except as the leaf is held toward the light when they appear almost transparent. In the same position the leaf is seen also to be edged with a slight delicate fringe (appearing in the dried leaf like a line of yellow light).

Bark of trunk dark and rough.

Flowers, greenish-yellow and small, at the base of the leaf-stems. June.

Fruit, about one inch in diameter, rounded, nearly stemless, orange-red when ripe, with about eight large flat seeds. After frost it is of very pleasant flavor; before, exceedingly "puckery."

Found, from Connecticut southward to Florida and westward to Southeastern Iowa.

A tree twenty to sixty feet high; sometimes, at the South, more than one hundred feet high. The wood is hard and close-grained; the bark tonic and astringent.

Fig. 7.—Persimmon. (D. Virginiàna, L.)
NATURAL SIZE.

Genus SASSAFRAS, Nees. (Sassafras.)

Fig. 8.—Sassafras. *S. officinàle, Nees.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE OR LOBED.

Outline, when the edge is entire usually oval or egg-shape; when lobed usually broader and reverse egg-shape. *Base*, pointed or wedge-shape. *Apex* of the leaf or of the lobes rounded or slightly blunt-pointed.

Leaf, variable in size, dark, thin, smooth; rather shining above; the lobes, when present, two or three in number and usually more or less bulging, with the hollows always rounded.

Flowers, greenish-yellow, in clusters. May, June.

Fruit, oval, one-seeded, blue, with a reddish, club-shaped stem; pungent.

Bark, obliquely and curiously furrowed and broken, gray without, reddish within; young twigs yellowish.

Found, from Southwestern Vermont, southward and westward.

A tree fifteen to fifty feet high with light and soft wood. All parts of the tree have a pleasant, spicy taste and fragrance. From the bark of the roots a powerful aromatic stimulant is obtained.

NOTE.—See *Alternate-leaved Dogwood*, with its genus, Section B, *I.*, p. 136

NOTE.—See *Willow Oaks*, with their genus, Section A, *III. (a)*, pp. 126–128

Fig. 8.—Sassafras. (S. officinàle, Nees.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

LEAVES ALTERNATE

CONTINUED

(EDGE TOOTHED)

A II

Genus TILIA, L. (Basswood.)

Fig. 9.—Basswood, American Linden, Whitewood, Lime Tree, Bee Tree. *T. Americàna, L.*

Leaves, SIMPLE; ALTERNATE; EDGE SOMEWHAT IRREGULARLY VERY SHARP-TOOTHED.

Outline, rounded, often very one-sided. *Apex*, pointed. *Base*, strongly heart-shaped.

Leaf, usually about three to four inches wide, four to five inches long; sometimes much larger; rather thick, very smooth and shining above; with small tufts of reddish hairs in the angles of the ribs below; and often with the ribs themselves hairy.

Bark of the trunk very thick; on the young branches dark brown.

Fruit, gray-downy, ovate, the size of small peas, clustered on a long stem of which the lower half is joined to half the length of a narrow, leaf-like bract, usually with a tapering base.

Found, in rich woods, from British America southward to Virginia and along the Alleghany Mountains and westward.

A straight-trunked tree, sixty to eighty feet high (often unbranching to half its height) and two to four feet in diameter. Its very tough inner bark is used for mats and coarse rope. The wood is white and soft and clear of knots. It is much used for wooden ware, in cabinet-work, and for the panelling of carriages, though now less esteemed than the tulip tree for these uses, owing to its liability to crack in bending.

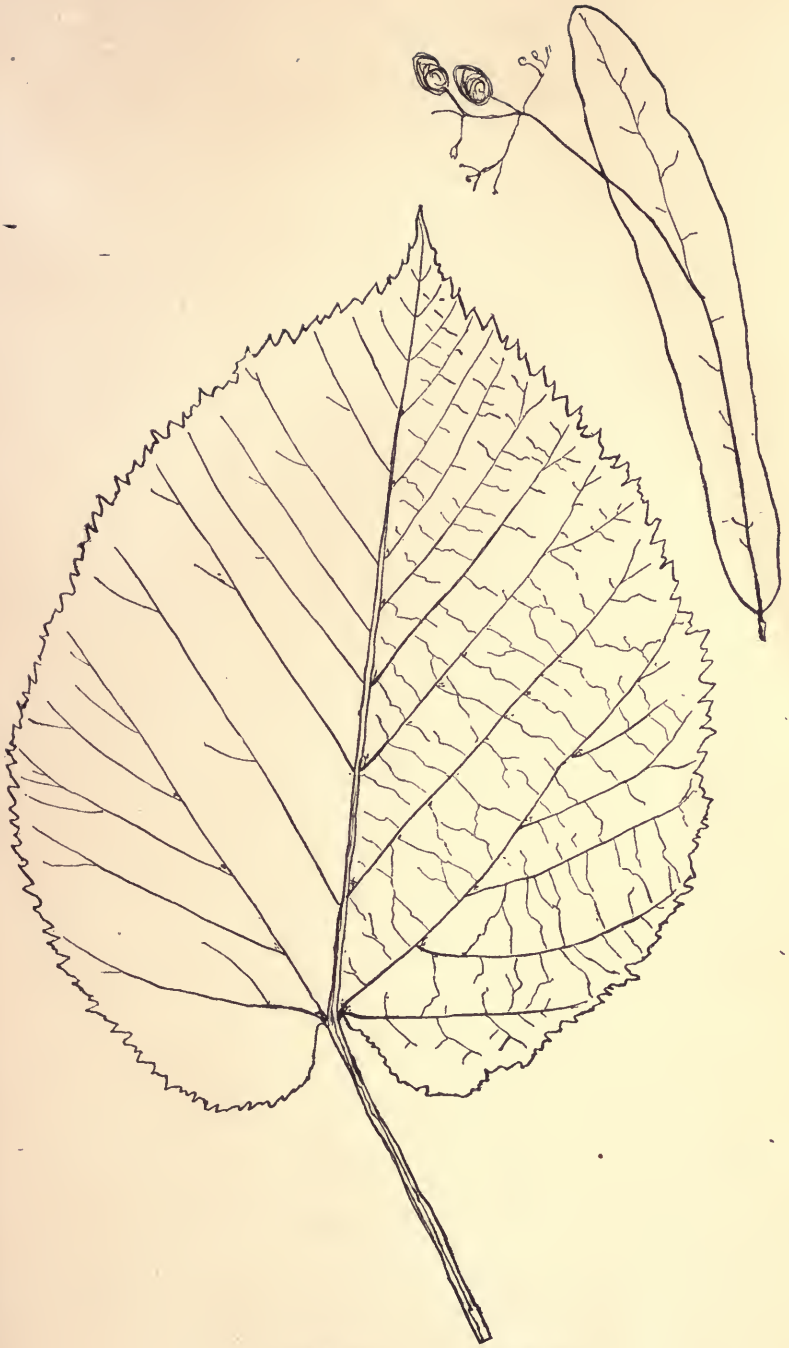

Fig. 9.—Basswood. (T. Americàna, L.)
NATURAL SIZE.

White Basswood, Wahoo. *T. heterophylla, Vent.*

This species differs from T. Americana chiefly in the following items:

Leaf, five to eight inches long; deep green and shining above, beneath velvety and silvery white with purplish ribs.

Found, from the mountains of Pennsylvania to Georgia and westward.

Height, usually twenty to thirty feet.

T. pubescens, Ait., differs chiefly from T. Americana in these particulars:

Leaves, smaller (two to three inches long), thinner, and somewhat downy beneath.

Fruit, rounded, about one fourth of an inch in diameter, and with the base of the leaf-like bract to which it is attached usually rounded at the base.

Found, New York to Florida and westward.

The cultivated *European Linden* [T. Europæa] resembles the Basswood in its foliage, but the tree is smaller (about forty feet high) and with a pyramid-shaped top.

Genus ILEX, L. (Holly.)

Fig. 10.—American Holly. *I. opàca, Ait.*

Leaves, SIMPLE; ALTERNATE; EDGE WITH REMOTE, VERY SHARP SPINE-LIKE TEETH, with rounded spaces between.

Outline, oval. *Apex* and *base*, pointed.

Leaf, about two inches long; dark polished green above; below rather yellowish-green; thick and stiff; smooth throughout; ribs very indistinct below.

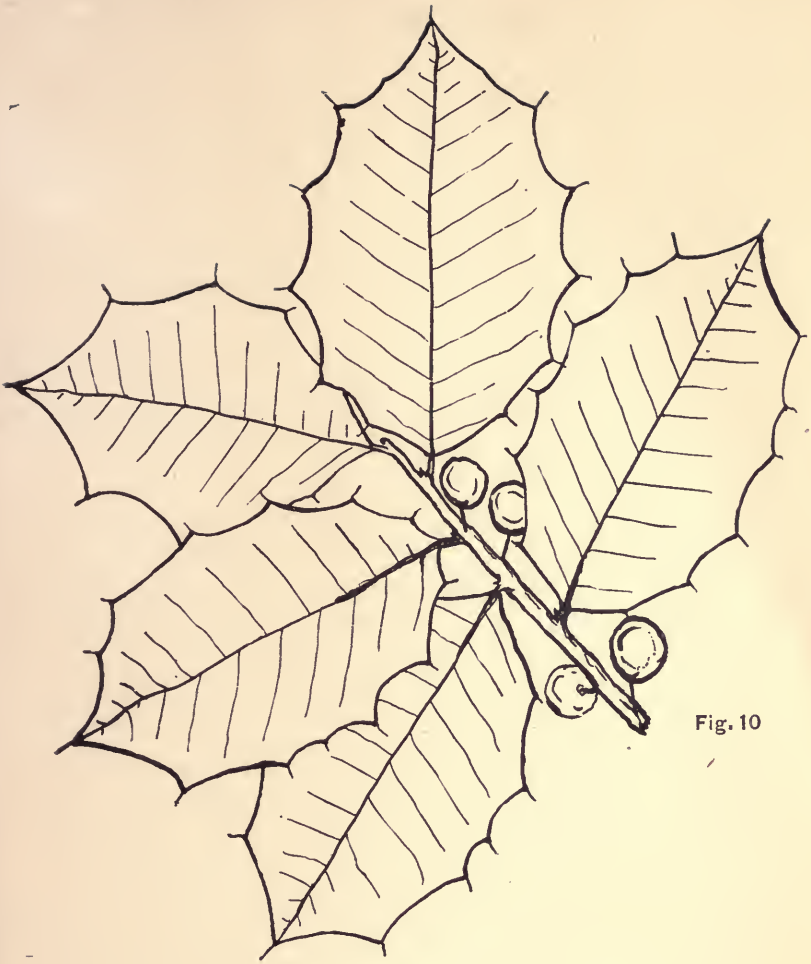

Fig. 10

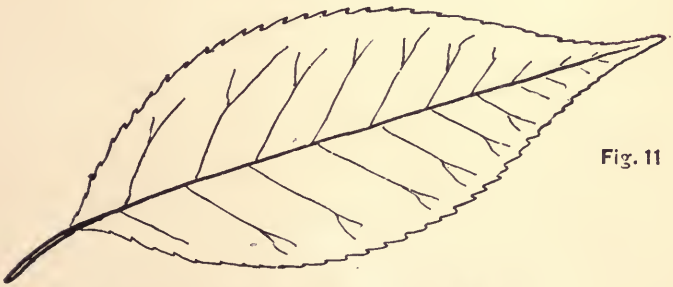

Fig. 11

Fig. 10.—American Holly. (I. opàca, Ait.)
Fig. 11.—I. montìcola.
NATURAL SIZE.

Bark, light gray and smooth.

Fruit, a nearly round, bright-red berry, the size of a pea. It ripens in September and continues upon the branches into the winter.

Found, from Massachusetts southward near the coast to Florida, and from Southern Indiana southwest, and southward to the Gulf.

An evergreen tree, ten to thirty feet high, with a compact head of spreading branches. Its wood is easily worked, white, of fine grain, and light in weight.

The use of holly and other evergreens in religious ceremonies dates from pagan times. "Trummying of the temples with floures, boughes, and garlondes, was taken of the heathen people, whiche decked their idols and houses with suche array." Early church councils made rules and restrictions concerning the practice—*e.g.*, in France Christians were forbidden "to decke up their houses with lawrell, yvie, and green boughes in the Christmas season," for "*Hedera est gratissima Baccho.*" *

Fig. 11.—*Ilex montìcola, Gray.*

This is usually regarded as a shrub, "but it not seldom attains the size and exhibits the port of a small tree"—(T. C. Porter). It differs from I. opàca chiefly in these items:

Leaves, not evergreen; egg-shape or long oval, rather thin with edge finely toothed, and apex taper-pointed.

Found, in damp woods in the Catskill and Tahonic Mountains, and in Cattaraugus County, New York; through Pennsylvania as far east as Northampton County, and southward along the Alleghanies.

* The ivy is most acceptable to Bacchus.

Genus PRUNUS L. (Cherry, Plum.)

Fig 12.—Wild Black Cherry, Rum Cherry. *P. serótina, Ehr.*

Leaves, SIMPLE; ALTERNATE; EDGE TOOTHED (with the points of the teeth so incurved as to appear blunt), and often finely "crinkled."

Outline, usually long oval or long egg-shape. *Base*, rounded or slightly pointed. *Apex*, pointed.

Leaf-stem, usually with two to five tooth-like glands near the base of the leaf.

Leaf, two to five inches long; thickish; polished, and of a deep shining green above; beneath, lighter and smooth, with the middle rib sometimes downy toward the base. In the autumn the leaves turn to orange, and later to a pale yellow.

Bark of old trunks, blackish and rough; of young trunks and on the larger branches, reddish or purplish brown; marked with scattered lines; on young shoots, at first green or olive brown, gradually becoming darker, and sprinked with small orange dots.

Flowers, white, with short stems, closely set in a long, cylinder-shaped cluster. May, June.

Fruit, about one and a quarter inches in diameter; with short stems (one and a quarter to one and a third inches) hanging in long, close clusters from the ends of the twigs. It is nearly black when ripe, and of a pleasant flavor though somewhat bitter; it is eagerly eaten by the birds. August.

Found, very widely distributed north, south, and west. It reaches its finest growth on the western slopes of the Alleghany Mountains.

A tree fifty to eighty feet high. The wood is light and hard, of a brown or reddish tinge, becoming darker with exposure, and of very great value in cabinet-work and interior finish. It is now becoming scarce, so that stained birch is often used as a substitute. The bitter aromatic bark is used as a valuable tonic; "cherry brandy" is made from the fruit.

Fig. 13. — Wild Red Cherry, Bird Cherry, Pin Cherry.
P. Pennsylvànica, L.

Leaves, SIMPLE; ALTERNATE, or alternate in pairs; EDGE FINELY AND SHARPLY TOOTHED.

Outline, narrow egg-shape. *Apex*, taper-pointed. *Base*, rounded or slightly pointed.

Leaf-stem, grooved above.

Leaf, two to six inches long, shining and smooth and of about the same shade of green on both sides.

Bark, reddish-brown and smooth, with swollen, rusty-colored dots, and usually stripping, like that of the garden cherry, around the trunk.

Flowers, white, on stems about one inch or more in length, in nearly stemless clusters. May.

Fruit, the size of a large pea, light red, on long stems (about three fourths to one inch long), sour, in clusters of two to five at the sides of the branches, and usually from the base of the leaf-stems; seldom abundant. July.

Found, Common in all northern forests. In Northern New England it quickly occupies burned-out pine regions.

A slender tree, usually twenty to twenty-five feet high, of no value as timber.

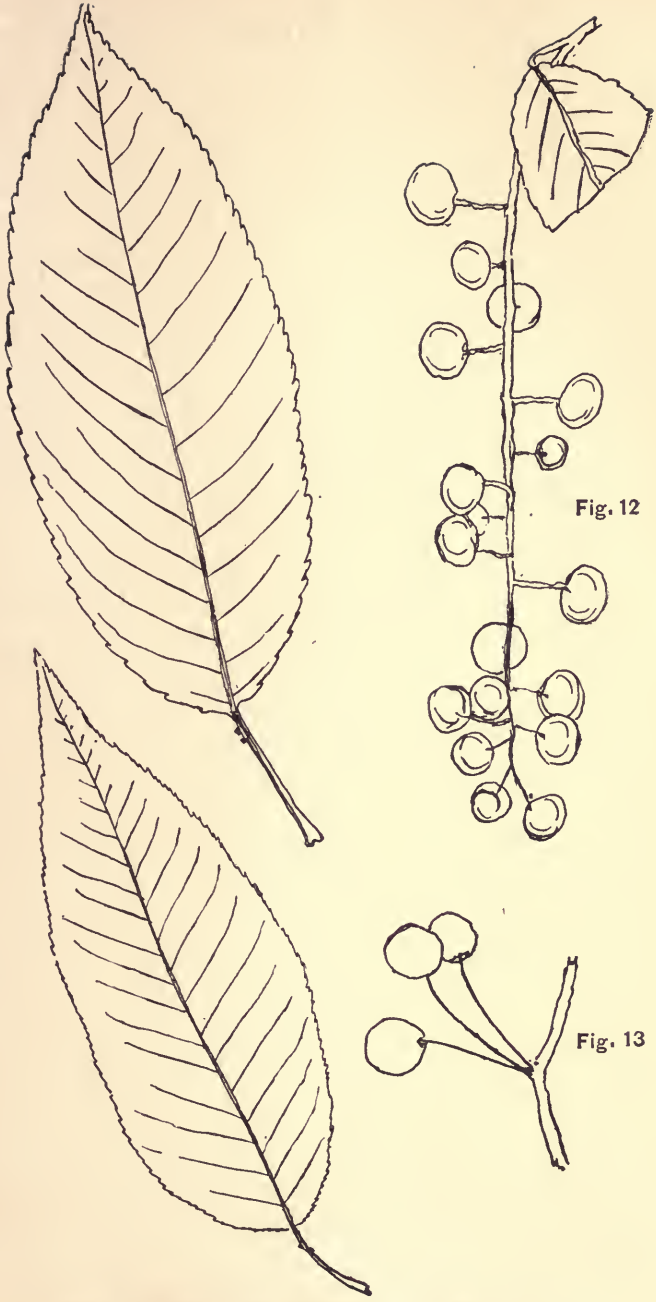

Fig. 12.—Wild Black Cherry. (P. serótina, Ehr.)
Fig. 13.—Wild Red Cherry. (P. Pennsylvánica. L).
NATURAL SIZE.

Fig. 14.—Wild Plum, Canada Plum, Horse Plum. *P. Americàna, Marsh.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED.

Outline, long oval to reverse egg-shape. *Apex*, taper-pointed. *Base*, pointed or rounded.

Leaf-stem, one fourth to one half inch long, smooth, reddish, usually with two small wart-like glands on the raised border near the base of the leaf.

Leaf, two to three inches long; smooth when mature; "net-veined," with distinct furrows over the ribs; somewhat downy on the ribs and in their angles.

Bark of trunk very dark reddish-green or bronze-green, resembling that of a cherry-tree.

Fruit, one half to two thirds inch in diameter; broad oval; yellow, orange, or red; with a thick and acid skin and a pleasant flavor. August.

Stone, slightly flattened, and with both edges winged and sharp.

Found, from Canada southward to Florida and westward, and often in cultivation.

A small tree (sometimes a bush), eight to twenty feet high, with hard, reddish wood. In cultivation it forms an excellent stock on which to graft the domestic plums.

Fig. 14.—Wild Plum. (P. Americàna, Marsh.)
NATURAL SIZE.

Genus PYRUS L. (Apple, Mt. Ash.)

NOTE. (See others of same genus, Sec. D, *II.*)

Fig. 15.—Crab-Apple. *P. coronària, L.*

Leaves, SIMPLE; ALTERNATE; EDGE DISTINCTLY TOOTHED WHEN MATURE; sometimes nearly three-lobed.

Outline, egg-shape or oval. *Apex*, pointed. *Base*, rounded or somewhat heart-shaped.

Leaf-stem, one half to one inch long, very slender, downy.

Leaf, about two to three inches long, two thirds as wide, smooth.

Flowers, large; rose-colored and white, in loose clusters of five to ten blossoms, and very fragrant. May.

Fruit, round, one to one and a half inches in diameter; yellowish, fragrant, hard, and sour; fit only for preserving.

Found, from Ontario to Western New York, Pennsylvania, and the District of Columbia; along the Alleghany Mountains, and westward.

A small tree, ten to twenty feet high, rarely thirty feet, gaining its finest growth in the valleys of the lower Ohio. Often its presence is recognized before it is seen by means of the delightful fragrance of its blossoms.

The *Narrow-leaved Crab-Apple* (P. angustifòlia, Ait.) is sometimes, though very seldom, found as far north as Southern Pennsylvania.

Its leaves are narrower and its fruit and flowers smaller than in the northern species.

Fig. 15.—Crab-Apple. (P. coronària, L.)
NATURAL SIZE.

Genus CRATÆGUS, L. (Thorn.)

From a Greek word meaning strength.

Fig. 16.—White Thorn, Scarlet-fruited Thorn, Red Haw. *C. coccìnea, L.*

Leaves, SIMPLE; ALTERNATE (and in alternate bunches); EDGE UNEVENLY SHARP-TOOTHED (with five to nine deep cuts almost forming small lobes).

Outline, rounded egg-shape. *Apex*, pointed. *Base*, usually slightly pointed, but often blunt or slightly heart-shape.

Leaf-stem, slender and often with small wart-like glands.

Leaf, usually one and a half to two and a half inches long, but of variable size on the same tree; thin; smooth; shining.

Branchlets, greenish, or whitish and shining, as though washed with silver. *Thorns*, one to two inches long, stout, often whitish, usually slightly curved.

Flowers, about two thirds of an inch across; white (often with a rosy tinge); twelve or so in a bunch; with a strong and rather disagreeable odor. May.

Fruit, nearly one half inch in diameter; rounded or egg-shape; bright red; with thin pulp and one to five stones; somewhat edible. September.

Found, through the Atlantic forests southward to Northern Florida and Eastern Texas.

A low tree (or often a bush), ten to twenty feet high, with crooked, spreading branches; very common at the North; rare in the South.

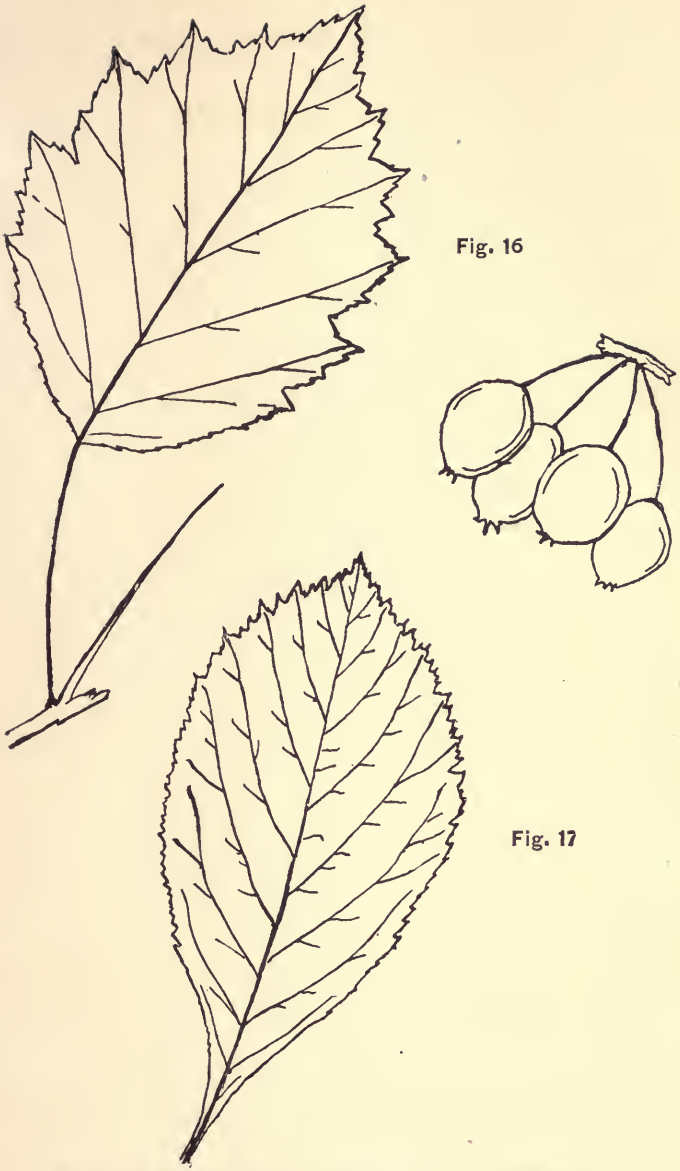

Fig. 16

Fig. 17

Fig. 16.—White Thorn and Fruit. (C. coccinea, L.)
Fig. 17.—Black Thorn. (C. tomentòsa, L.)
NATURAL SIZE.

A variety with its leaves downy, at least on the under side, and with its red fruit large and downy (*var. mollis*), is found from Central Michigan southward and westward.

Fig. 17.—Black Thorn, Pear Thorn. *C. tomentòsa, L.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARPLY AND UNEQUALLY TOOTHED (sometimes with quite deep and sharp cuts, almost forming small lobes).

Outline, oval or reverse egg-shape. *Apex*, slightly pointed. *Base*, tapering in a hollow curve and along the sides of the leaf-stem to a point.

Leaf-stem, bordered by the leaf, to its base.

Leaf, about three to five inches long, one and a half to three inches wide; upper surface smoothish, and furrowed above the ribs; under surface downy, at least when young; rather thick; permanently downy on the ribs. *Thorns*, one to two inches long.

Bark of trunk, smooth and gray. New twigs, light greenish-brown.

Flowers, often one inch across; white; eight to twelve in a cluster; at the ends of the branches; fragrant. May, June.

Fruit, about one half inch in diameter; round or pear-shaped; orange-red or crimson; edible. October.

Found, through the Atlantic forests to Western Florida, and from Eastern Texas far westward. Common.

A thickly branching tree (or often a shrub) eight to twenty feet high; the most widely distributed of the American Thorns. It varies greatly in size, and in the style of its fruit and leaves.

Fig. 18.—Common Thorn. (C. punctàta, Jac.)
NATURAL SIZE.

Fig. 18.—Common Thorn, Dotted-fruited Thorn. *C. punctàta, Jac.*

Leaves, SIMPLE; ALTERNATE; EDGE UNEVENLY SHARP-TOOTHED ABOVE THE MIDDLE; sometimes, toward the apex deeply cut.

Outline, reverse egg-shape. *Apex*, usually slightly pointed. *Base*, strongly wedge-shape, tapering from above the middle of the leaf and along the leaf-stem to a point.

Leaf-stem, one half to one inch long, slender, and winged by the tapering leaf.

Leaf, one and a half to two and a half inches long; about as wide; light green; rather thick; downy when young; when mature, smooth and dull, or sometimes hairy below, especially on the ribs. Ribs, very straight below; above, marked by deep furrows. *Thorns*, one to two inches long, stout and curved, or often wanting.

Bark, rough.

Flowers, white; eight to fifteen in somewhat leafy bunches. May.

Fruit, about one half inch in diameter, or more; usually dull red or yellow, with whitish dots; round; somewhat edible. September.

Found, from New Brunswick and Vermont southward and westward.

A thick, wide-spreading tree, twelve to twenty-five feet high.

Fig. 19.—Cockspur Thorn. *C. crus-galli, L.*

Leaves, SIMPLE; ALTERNATE; EDGE, SHARPLY TOOTHED ABOVE; ENTIRE BELOW.

Outline, reverse egg-shape. *Apex*, usually rounded, sometimes pointed. *Base*, tapering to a point, quite variable.

Leaf-stem, short.

Fig. 19.—Cockspur Thorn. (C. crus-galli, L.)
NATURAL SIZE.

Leaf, one to two and a half inches long, half to three quarters as wide; dark green; thick, smooth, very shining above. *Thorns*, two to three inches long, rather slender and straight.

Flowers, white; fragrant; in bunches of about fifteen blossoms, on very short side branchlets. June.

Fruit, about one third inch in diameter; pear-shaped or round; red remaining on the tree during the winter.

Found, along the St. Lawrence and westward, and from Vermont, southward and westward; not common.

A small, thick-branching tree, ten to twenty feet high. It is the best species of thorn for hedges.

Var. pyracanthifolia has a somewhat narrower leaf and longer leaf-stem.

Genus AMELÀNCHIER, Medik. (June-berry.)

Fig. 20.—Shad-bush, June-berry, Service Tree. *A. Canadènsis (L.), Medik.*

Leaves, SIMPLE; ALTERNATE; EDGE VERY SHARPLY AND FINELY TOOTHED.

Outline, long oval, long egg-shape, or reverse egg-shape. *Apex*, sometimes bristle-pointed. *Base*, slightly heart-shaped or rounded.

Leaf, usually two to three inches long, somewhat downy when young, afterward very smooth above and below.

Bark of branches and twigs usually purplish-brown and very smooth.

Flowers, large, white, in long and loose clusters at the ends of the branchlets; appearing before the leaves. April, May.

Fig. 20.—Shad-bush. A. Canadènsis (L.), Medik.
NATURAL SIZE.

Fruit, berry-like, round, purplish, sweet, and edible. June.

Found, in woods and along streams; common at the North; rare in the South.

A small tree, ten to thirty feet high, or in some of its numerous forms reduced to a low shrub; noticeable and showy in early spring because of its flowers.

The variety *A. C. oblongifòlia, T. and G.*, differs somewhat from the above in the dimensions of the flowers and flower clusters, etc.

The name "shad-bush" is given because the trees blossom about the time that the shad "run."

Genus OXYDÈNDRUM, D. C. (Sorrel Tree.)

From two Greek words meaning sour and tree.

Fig. 21.—Sorrel Tree, Sour Wood. *O. arbòreum (L.), D. C.*

Leaves, SIMPLE; ALTERNATE; EDGE TOOTHED.

Outline, oval. *Apex*, pointed. *Base*, rounded or slightly pointed.

Leaf, four to six inches long, one and a half to two and a half inches wide, soon becoming smooth, with a decided acid taste (whence the name).

Bark of trunk, rough and deeply furrowed.

Flowers, white, in loose and long one-sided clusters.

Found, from Pennsylvania and Ohio southward, chiefly along the Alleghany Mountains, and usually in dry, gravelly soil.

A tree forty to sixty feet high, with hard, close-grained wood, which is used for the handles of tools, the bearings of machinery, etc.

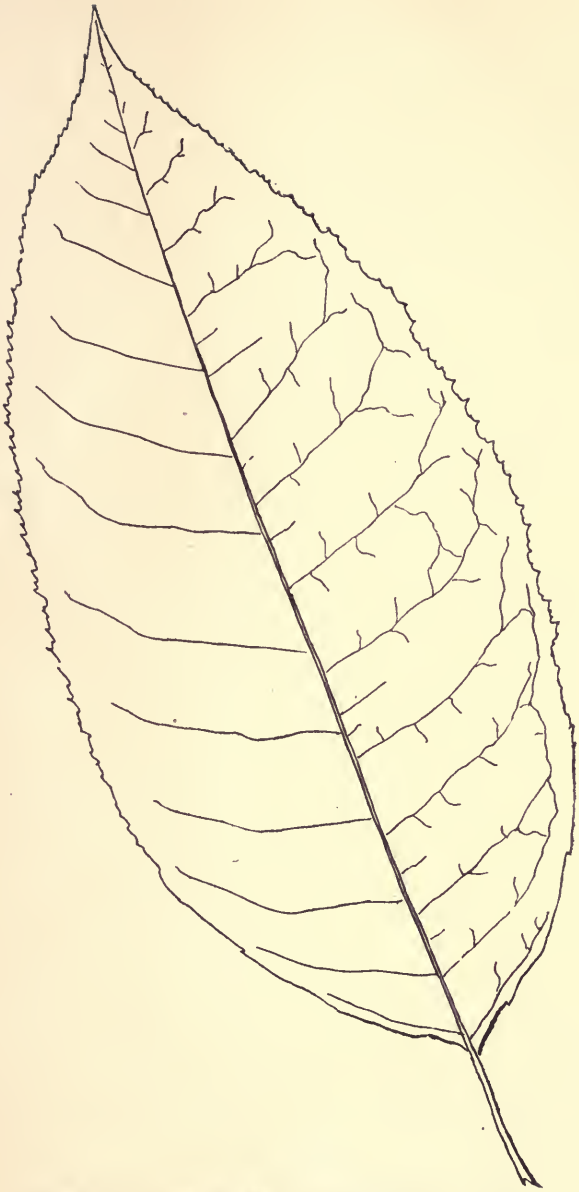

Fig. 21.—Sorrel Tree. O. arbòreum (L.), D. C.
NATURAL SIZE.

Genus ULMUS, L. (Elm.)

Fig. 22.—White Elm. *U. Americàna, L.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARPLY AND OFTEN DOUBLY TOOTHED.

Outline, oval or egg-shaped, or inversely egg-shaped; always one-sided.

Base, rounded, or slightly heart-shaped, rarely pointed. *Apex*, taper-pointed.

Leaf-stem, about one quarter inch long. *Buds*, smooth.

Leaf, usually two to five inches long, and one and a half to two and a half wide; somewhat downy when young, afterward roughish below; above, either rough in one direction, or (especially if taken from the ends of the long branches) smooth and shining. The *ribs* prominent and straight.

Bark of the branches not marked with "corky ridges"; branchlets, smooth.

Seeds, flat *egg-shaped* or *oval*, winged and *fringed* all around. Last of May.

Found, northward to Southern Newfoundland; southward to Florida; westward to the Black Hills of Dakota. Toward the western and southwestern limits it is found only in the river-bottom lands.

One of the very noblest of American trees, eighty feet or more in height, and of strong and graceful proportions. The trunk divides at a slight angle into two or three arching limbs, and these again into many smaller curving and drooping branches. The trunk and the larger branches are often heavily fringed with short and leafy boughs.

The tree is widely cultivated. Streets planted with it become columned and arched like the aisles of a Gothic cathedral.

The wood is hard, and very tough from the interlacing of its fibres. It is used in making saddle-trees and for

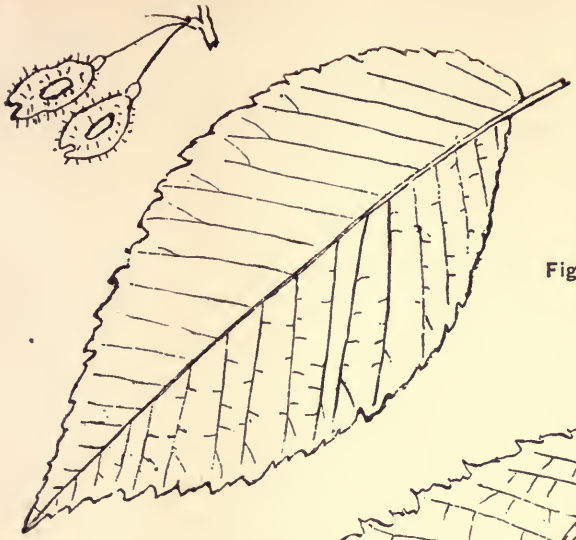

Fig. 22

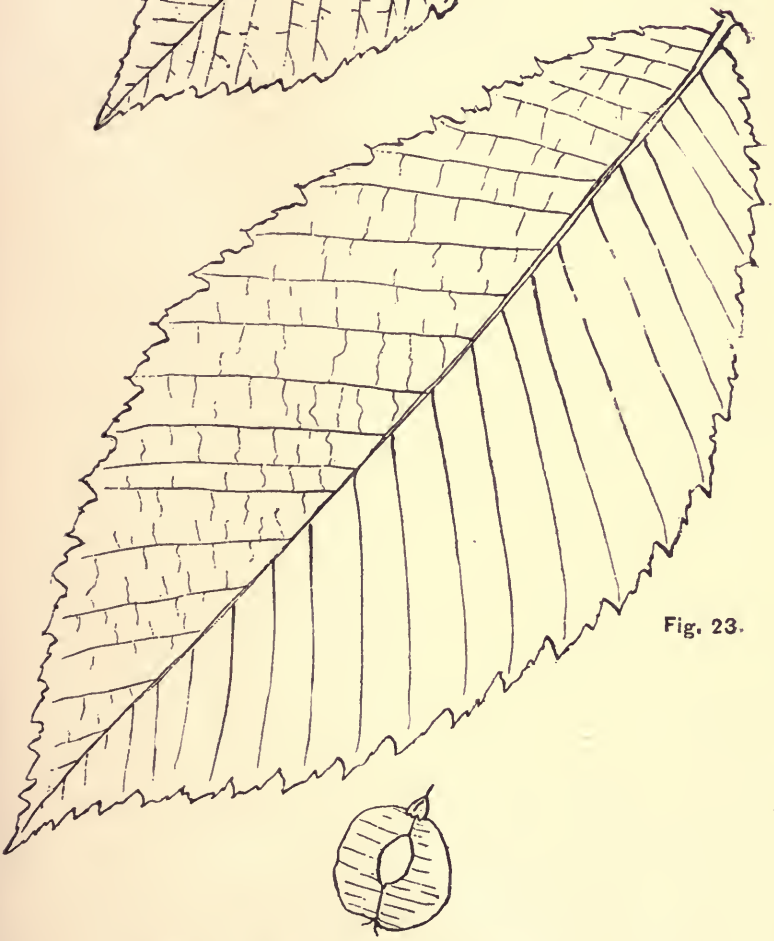

Fig. 23.

Fig. 22.—White Elm. (U. Americàna, L.)
Fig. 23.—Slippery Elm. (U. fulva, Michaux.).
NATURAL SIZE.

wheel-hubs, and is now largely exported to England to be used in boat- and ship-building.

One day I found four men in a stone quarry, working with iron bars and rollers over a heavy flat slab. They were moving the stone slowly up a narrow plank into their cart. "John," I said, "I would not think that board could hold a stone of such weight two minutes. Is it hickory?" "No sir," said John, "that 's an elm plank; it can't break." It did not break.

It was one of the woods which the Deacon used in building his famous "one-hoss shay":

"So the deacon inquired of the village folk
Where he could find the strongest oak,
That could n't be split nor bent nor broke,—
That was for spokes and floor and sills;
He sent for lancewood to make the thills;
The cross-bars were ash, from the straightest trees;
The panels of whitewood, that cuts like cheese,
But lasts like iron for things like these;
The hubs of logs from the 'Settler's Ellum,'—
Last of its timber,—they could n't sell 'em,
Never an axe had seen their chips,
And the wedges flew from between their lips,
Their blunt ends frizzled like celery-tips;"

—Oliver Wendell Holmes.

Corky White Elm. *U. racemòsa, Thomas.*

In foliage and shape and in the qualities of its timber this tree very closely resembles the white elm. A very noticeable difference is in its branches, which are often marked lengthwise with many large, corky, almost winged ridges. Its seeds resemble but are rather larger than those of the white elm.

Found, from Southwestern Vermont through Western New York and Southern Michigan to Northeastern Iowa, and southward through Ohio to Central Kentucky. Its finest growth is in Southern Michigan.

Fig. 23.—Slippery Elm, Red Elm. *U. fulva, Michaux, U. rubra, Michaux, f.*

Leaves, SIMPLE ; ALTERNATE ; EDGE SHARPLY AND DOUBLY TOOTHED.

Outline, oval or long egg-shape. *Apex*, taper-pointed. *Base*, slightly heart-shaped or rounded.

Leaf-stem, about one eighth inch long, stout and rough. Buds *hairy*.

Leaf, four to seven inches long, three to four inches wide. The upper surface is *rough both ways*, and *very* rough downwards, almost like a fine file. The under surface is slightly rough.

The *ribs* beneath are prominent and straight, and hairy in their angles.

Bark of the larger branches, brownish ; branchlets, light-gray and very *rough*, becoming grayish-purple. The inner bark is very *gummy and "slippery."*

Seeds, flat, *round*, winged, but *not fringed*. Last of May.

Found, along the lower St. Lawrence to Ontario, and from Western New England westward and southward ; in woods and along streams.

A tree thirty to forty feet high. Its wood is hard and strong, but splits easily when dry. Though otherwise inferior, for posts it is superior to white elm. Its inner bark is sold by druggists as "slippery elm," and is nutritious and medicinal. Its name of red elm is due to the reddish-brown tinge of its large rounded and hairy buds in the spring.

The *English Elm* [U. campèstris, L.] was introduced early, and is often found in cultivation. It differs from the white elm, especially in these items :

Leaves, usually smaller, and more closely placed upon the branch.

Bark, darker and much more broken.

Branches, compact and more or less horizontal and straight to their ends, instead of arching and drooping.

Seeds, resembling in shape those of the slippery elm.

The tree is sometimes seen sixty to seventy feet high, but usually is much smaller. Like all the elms it is of rapid growth.

Genus CELTIS, L. (Hackberry.)

An ancient name for the Lotus.

Fig. 24.—Hackberry, Sugar Berry. *C. occidentàlis, L.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED, but entire at the base.

Outline, obliquely egg-shaped, very one-sided. *Apex*, taper-pointed. *Base*, usually somewhat heart-shaped, or slightly pointed or rounded.

Leaf, two to three inches long, one to two inches wide; rough.

Bark of the trunk, rough; sometimes much crumpled.

Fruit, about the size of a pea; solitary; drooping from the bases of the leaf-stems, on stems once or twice as long as the leaf-stems; rounded; pulp thin, sweet, and edible; purplish red; ripe in September.

Found, from the valley of the St. Lawrence westward and southward.

A tree fifteen to thirty feet high (but much larger at the South), most common, and reaching its finest growth in the basin of the Mississippi. It is very variable in size and in the shape and texture of its leaves.

Variety *crassifòlia* is sometimes found, in which the leaves are thicker and usually toothed all around.

Fig. 24.—Hackberry. (C. occidentàlis, L.)
NATURAL SIZE.

Genus MORUS, L. (Mulberry.)

Fig. 25.—Red Mulberry. *M. rubra, L.*

Leaves, SIMPLE; ALTERNATE; EDGE COARSELY AND SOMEWHAT IRREGULARLY TOOTHED; or, at times, unequally and very variously TWO- TO THREE-LOBED.

Outline, egg-shape. *Apex*, long pointed (when there are side lobes their ends may be rounded). *Base*, heart-shaped, and more or less one-sided.

Leaf, three to seven inches long, rather thin, rough above and downy below, sometimes becoming very smooth. The ribs are very distinct, and whitish below.

Bark, grayish, and much broken.

Berries, about the size and shape of small blackberries. When ripe they are very dark purple (nearly black), juicy, and sweet. July.

Found, from Western New England, westward and southward.

A tree fifteen to twenty-five feet high; in the Middle and Western States much larger. It is most common and reaches its finest growth along the lower Ohio and the Mississippi rivers. Its wood is valuable, light, and soft, but very durable in contact with the ground.

The *White Mulberry* [M. alba] is sometimes found around old houses and in fields. It was introduced from China, and was formerly cultivated as food for silk-worms. Its leaves resemble those of the Red Mulberry in shape, but are smooth and shining.

Fig. 25.—Red Mulberry. (M. rubra, L.)
NATURAL SIZE.

Genus BROUSSONÈTIA, L'Her.

Paper Mulberry. [*B. papyrìfera, Vent.*]

Leaves, SIMPLE; ALTERNATE; EDGE IRREGULARLY SHARP-TOOTHED, or, at times, unequally and very variously two- to three-lobed.

Outline, very nearly that of the Red Mulberry (Fig. 25) broad egg-shape. *Apex*, taper-pointed (when there are side lobes their ends also pointed). *Base*, rounded or slightly pointed, rarely, in the small leaves, slightly heart-shaped.

Leaf-stem, rough.

Leaf, usually about five inches long, sometimes nine inches; thick; rough above, *very velvety-rough*. The main ribs are very distinct, and are thickly netted with smaller ones.

Bark, light and smoothish.

Flowers, in long aments and balls.

Fruit, not edible.

An introduced tree, common around houses or escaped from cultivation.

A low-branching, large-headed shade tree of medium size, introduced from Japan.

In Japan and China the bark of the Paper Mulberry is made into paper, whence the name.

Genus PLÀTANUS, L. (Buttonwood.)

From a Greek word meaning broad, in reference to the breadth of its shade or of its leaf.

Fig. 26. — Buttonwood, Buttonball Tree, Plane Tree, Sycamore.* *P. occidentàlis, L.*

Leaves, SIMPLE; ALTERNATE; EDGE VARIABLE, EITHER COARSE-TOOTHED OR SOMEWHAT LOBED; with the teeth or lobes sharp, and the hollows between them rounded.

Outline, rounded. *Apex*, pointed. *Base*, more or less heart-shaped, squared, or rounded.

Leaf-stem, downy when young, smoothish when old; and covering the leaf-bud with its swollen base.

Leaf, three and a half to eight inches wide, and usually broader than long; downy beneath when young, becoming smooth.

Bark, the thin outer bark peels off each year in hard and brittle strips, leaving the branches and parts of the trunk with a mottled, whitish, polished-looking surface.

Flowers, small, in compact, round balls (about one inch in diameter) like round buttons, which dry and harden, and cling to the branches by their slender stems (three to four inches long), and swing like little bells during a good part of the winter.

Found, from Southern Maine, southward and westward, in rich, moist soil, oftenest along streams. Its finest growth is in the bottom lands of the Mississippi and Ohio rivers.

* The name "sycamore," though a common one, should be dropped. It belongs to another and very different tree.

Fig. 26.—Buttonwood. (P. occidentàlis, L.)
NATURAL SIZE.

The largest of the trees of the Atlantic forests, commonly sixty to eighty feet high; along the western rivers often eighty to one hundred and thirty feet high, sometimes more, with a circumference of forty to fifty feet.

A tree in Eaton, N. J., is one of the largest in the State. It is eighty-five feet high. At a point eight feet from the ground its circumference is fourteen feet three inches. The largest trunks are usually hollow. The wood is hard and compact, difficult to split and work, of a reddish-brown color within. Its principle use is in the making of tobacco boxes.

There is a fine and somewhat noted group of these trees on the grounds of James Knox, in Knoxboro, N. Y. In old times they formed a favorite camping place for the Indians in their trading expeditions. They all measure not far from three feet in diameter.

Genus BÈTULA, L. (Birch.)

Fig. 27.—White Birch, Old-field Birch, Gray Birch. *B. populifòlia, Marsh.*

Leaves, SIMPLE; ALTERNATE (often alternate in pairs); EDGE UNEQUALLY SHARP-TOOTHED, with the base entire.

Outline, triangular. *Apex,* taper-pointed. *Base,* variable, more or less squared, sometimes slightly hollowed, rounded, or pointed.

Leaf-stem, long and slender, about three quarters of an inch or more in length.

Leaf, one and three quarters to three inches long. Smooth and shining on both sides.

The *outer bark* of the mature trunk is chalky-white and thin, but not, like the bark of the Paper-birch, easily separable into layers. Usually it is marked with blackish dots and lines. Often the branchlets and twigs are blackish, and in very young trees the bark may be light reddish-brown, and marked with white dots.

Found, on poor soil, from Delaware and Pennsylvania northward (mostly toward the coast), and in ornamental cultivation. It springs up abundantly over burned and abandoned lands.

A slender, short-lived tree, twenty to thirty feet high, with white, soft wood, not durable; used largely in making spools, shoe-pegs, etc., and for fuel.

A still more graceful cultivated species is the European *Weeping Birch* [B. pèndula]. Its branches are very drooping, with more slender leaves, and a spray that is exceedingly light and delicate, especially in early spring.

Fig. 28.—Paper Birch, Canoe Birch, White Birch. *B. papyrìfera, Marsh.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARPLY AND UNEQUALLY DOUBLE-TOOTHED.

Outline, egg-shaped. *Apex*, pointed. *Base*, rounded, slightly heart-shaped, or, rarely, wedge-shaped.

Leaf-stem, downy.

Fig. 27

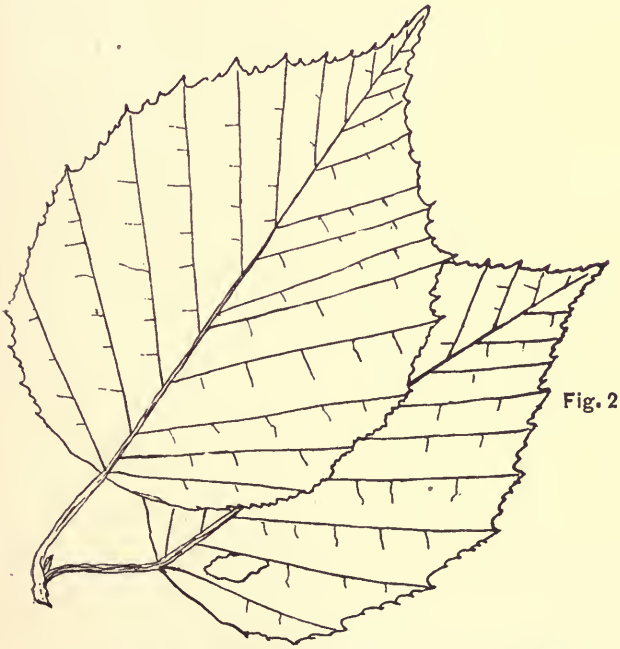

Fig. 28

Fig. 27.—White Birch. (B. populifòlia, Marsh.)
Fig. 28.—Paper Birch. (B. papyrìfera, Marsh.)
NATURAL SIZE.

Leaf, two to three inches long; dark green and smooth above; beneath, *dull*, and with the *ribs somewhat hairy*, especially in their angles.

Bark of trunk very tough and durable; thick; snow-white on the outside; *easily removed* from the wood, and then itself *very separable* into paper-like sheets. The inner sheets are of a reddish tinge.

Found, in the mountains of Northern Pennsylvania, New England, and far northward, farther than any other non-evergreen tree of America, excepting the aspen.

A tree, forty to seventy feet high. The wood is light, hard, and very close-grained, but decays rapidly when exposed—more rapidly than the bark, which often remains as a shell long after the wood within has disappeared. It is very largely used in making spools, pegs, shoe-lasts, in turnery, for wood-pulp, and for fuel. The waterproof bark is much used by Indians and trappers for their canoes.

"Give me of your bark, O Birch-Tree!
Of your yellow bark, O Birch-Tree!
Growing by the rushing river,
Tall and stately in the valley!
I a light canoe will build me,
That shall float upon the river,
Like a yellow leaf in autumn,
Like a yellow water-lily.
'Lay aside your cloak, O Birch-Tree!
Lay aside your white-skin wrapper,
For the summer time is coming,
And the sun is warm in heaven,
And you need no white-skin wrapper!'"

Hiawatha.

Fig. 29.—Red Birch, River Birch. *B. nigra, L.; B. rubra, Michaux, f.*

Leaves, SIMPLE; ALTERNATE; EDGE UNEQUALLY DOUBLE-TOOTHED; entire at base.

Outline, egg-shape, often approaching diamond-shape. *Apex*, pointed. *Base*, somewhat pointed, often rather blunt wedge-shaped.

Leaf-stem, short (about one half to three fourths of an inch) and downy.

Leaf, about three inches long by two inches wide, or often less; whitish and (until old) downy beneath; dotted; in autumn turning to a bright yellow.

Bark of the trunk reddish-brown. As the tree grows the bark becomes torn and loose, hanging in thin shreds of varying shades. The young twigs are downy.

Found, on low grounds, especially along river banks, from Massachusetts westward and southward. It becomes common only in the lower part of New Jersey. Its finest growth is in the South. It is the only birch which grows in a warm climate.

A tree usually thirty to fifty feet high, with the branches long and slender, arched and heavily drooping. Often the branches cover the trunk nearly to the ground. "Birch brooms" are made from the twigs.

Fig. 30.—Yellow Birch. *B. lùtea, Michaux, f.*

Leaves, SIMPLE; ALTERNATE (often alternate in pairs); EDGE VERY SHARPLY, UNEQUALLY, AND RATHER COARSELY TOOTHED.

Outline, egg-shape. *Apex*, pointed. *Base*, narrowed and *heart*-shaped.

Leaf-stem, short and downy.

Leaf, about four by two and one fourth inches, or often smaller; thin; downy when young, becoming smooth.

Ribs, straight.

Outer bark of trunk thin and a *silvery yellow*, and separating into narrow ribbons curling outwards at the ends. The twigs and the bark are sweet-tasting and aromatic, but less so than in the "Sweet Birch."

Found, in moist woods, along the Alleghany Mountains, in Delaware and Southern Minnesota, and northward into Canada.

A tree forty to eighty feet or often more in height; one of the largest and most valuable non-evergreen trees of New England and Canada. Its hard, close-grained wood is largely used for fuel, in making furniture, button-moulds, wheel-hubs, pill-boxes, etc.

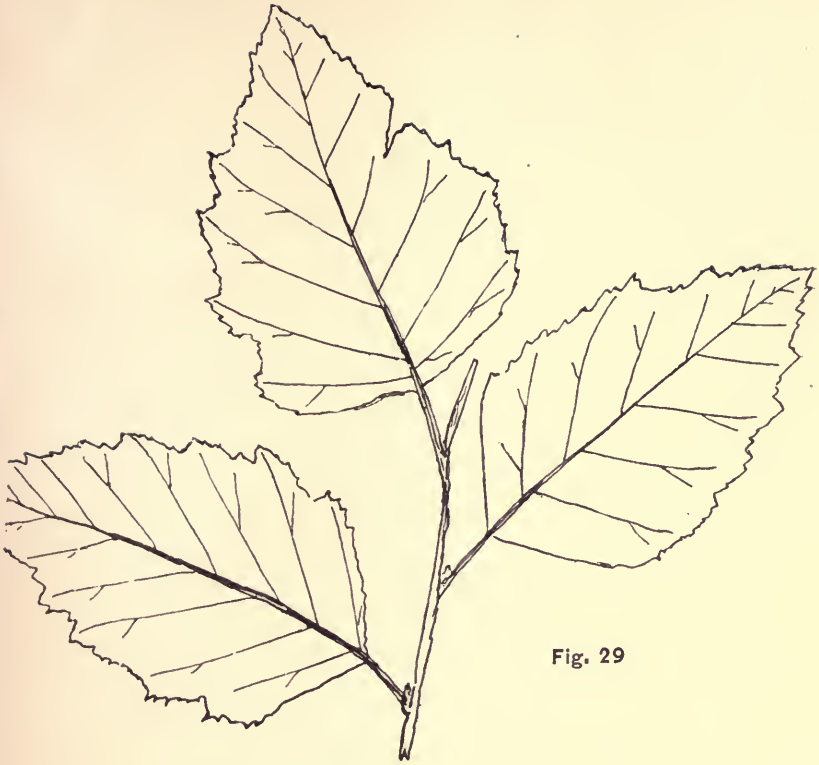

Fig. 29

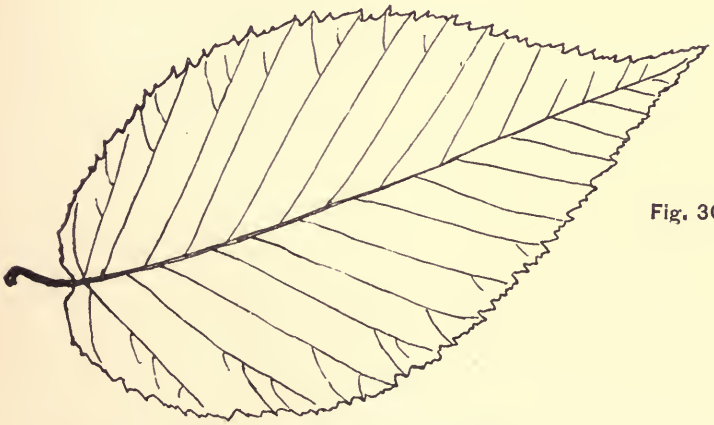

Fig. 30

Fig. 29.—Red Birch. (B. nigra, L.)
Fig. 30.—Yellow Birch. (B. lùtea, Michaux, f.)
NATURAL SIZE.

Fig. 31.—Sweet Birch, Cherry Birch, Black Birch. *B. lenta, L.*

Leaves, SIMPLE; ALTERNATE; EDGE FINELY AND SHARPLY DOUBLE-TOOTHED.

Outline, egg-shape. *Apex*, pointed. *Base*, heart-shaped.

Leaf-stem, short and downy.

Leaf, two to four inches long; about one half as wide; silky-hairy when young, but becoming smooth, except on the ribs beneath.

Bark of trunk, a *dark chestnut-brown;* smoothish when young, but becoming rough in old trees. The smaller branches are smooth and dotted with white spots. In its leaves and the color of the twigs it somewhat resembles the garden cherry. The foliage and bark are very aromatic and sweet-tasting.

Found, from Newfoundland to Northern Delaware, westward, and southward along the mountains. It is very common in the northern forests.

A tree thirty to sixty feet high, with many slender branches. The wood is hard, fine-grained, and of a reddish tint. It is largely used for cabinet-work (sometimes in place of the more valuable Black Cherry) and for fuel.

Fig. 31.—Sweet Birch. (B. lenta, L.)
NATURAL SIZE.

Genus ÒSTRYA, Scop. (Hop-Hornbeam.)

Fig. 32, *a* and *b*. — Hop-Hornbeam, Ironwood, Leverwood.
O. Virginiàna (Mill), Willd.

Leaves, SIMPLE; ALTERNATE; EDGE VERY SHARPLY AND SLIGHTLY IRREGULARLY AND UNEQUALLY TOOTHED.

Outline, long oval or long egg-shape. *Apex*, taper-pointed. *Base*, slightly heart-shaped.

Leaf-stem, about *one fourth inch* long, and often *rough*.

Leaf, usually three to four inches long, and about half as wide, but with many smaller leaves of varying size on the same branch; smoothish above, paler and somewhat downy below. The straight *ribs* and their angles hairy.

Bark of trunk, brownish or dark gray, and remarkable for being *finely furrowed* up and down, with the ridges broken into three- to four-inch lengths. These divisions are narrower than on any other rough-barked tree, and they become narrower and finer as the tree grows older. The new shoots are reddish green and dotted with brown; the younger branches purplish-brown and dotted with white or gray. When the branch is two to three inches thick, its bark becomes grayish and begins to crack.

Fruit, in long *oval, drooping clusters*, resembling those of the hop-vine, with *long, unlobed scales* that lap each other like shingles. August, September.

Found, oftenest on dry hill-sides. Common North, South, and West, especially in Southern Arkansas.

A tree twenty to thirty feet high, with white, very strong, and compact wood. It would be very valuable, if it were more abundant and of larger growth.

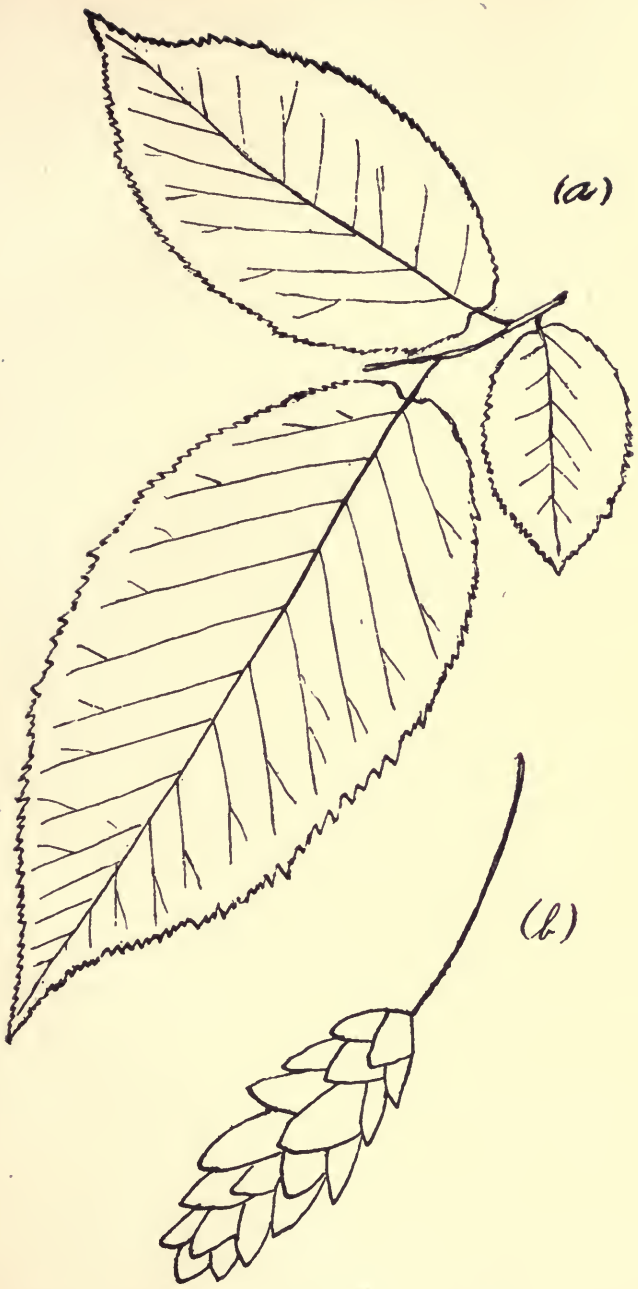

Fig. 32.—Hop-Hornbeam. O. Virginiàna (Mill), Willd.

a. Leaves. *b*. Fruit.

NATURAL SIZE.

Genus CARPÌNUS, L. (Hornbeam.)

Fig. 33, *a* and *b*.—**Hornbeam, Ironwood, Water Beech, Blue Beech.** *C. Caroliniàna, Walt.*

Leaves, SIMPLE; ALTERNATE; EDGE VERY SHARPLY AND QUITE IRREGULARLY AND UNEVENLY TOOTHED.

Outline, long egg-shape, or reverse long egg-shape. *Apex*, taper-pointed. *Base*, rounded or slightly heart-shaped.

Leaf-stem, about one half inch long, slender and smooth, or slightly hairy.

Leaf, usually three to four inches long, and about half as wide, but with many smaller leaves of varying size on the same branch; nearly smooth, slightly hairy on the straight and distinct ribs and in their angles.

Bark of trunk, a deep bluish-gray or slate; smooth, but often marked up and down with irregular ridges, which run from each side of the lower branches. The new shoots are somewhat hairy, and brownish or purplish; the older branchlets, an ashy-gray color, with a pearly lustre.

Fruit, in loose drooping cluster, with leaf-like scales that are strongly three-lobed and placed in pairs base to base. October.

Found, along streams and in swamps. Quite common North, South, and West; northward often only as a low shrub.

A small tree or shrub, usually ten to twenty feet high, but in the southern Alleghany Mountains sometimes reaching a height of fifty feet. Its wood is white and very compact and strong.

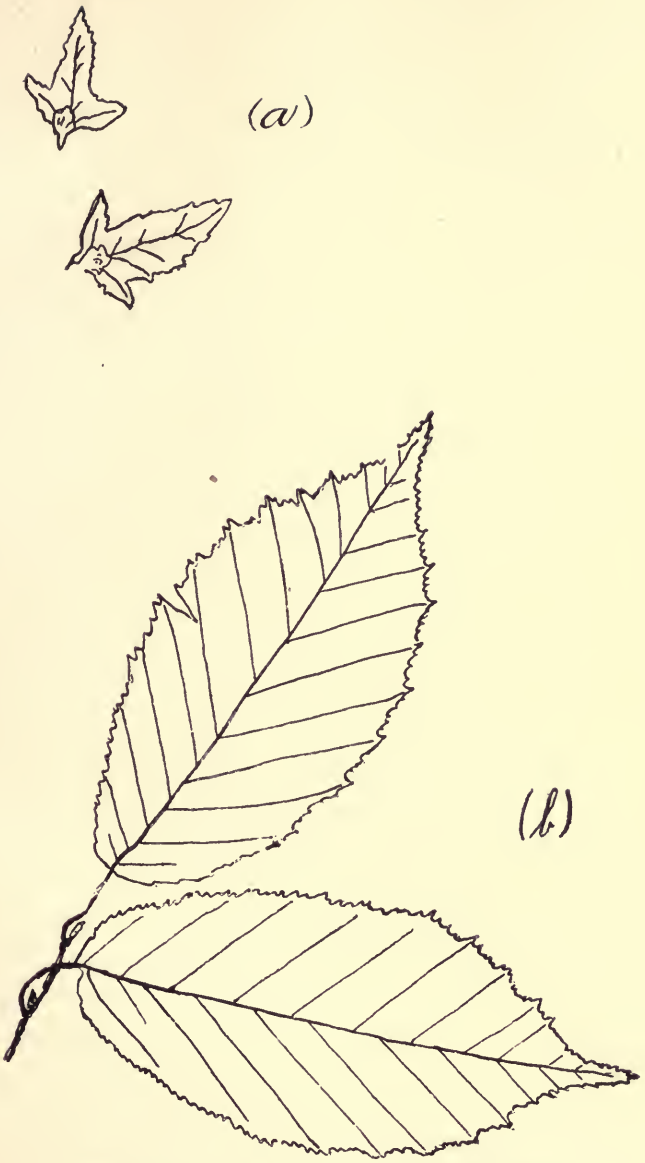

Fig. 33.—Hornbeam. (C. Caroliniàna, Walt.)

a. Fruit scales. *b*. Leaves.

NATURAL SIZE.

Genus CASTÀNEA, L. (Chestnut.)

From the name of a town in Thessaly.

Fig. 34.—Chestnut. *C. sativa (L.), var. Americàna (Michaux), Sarg.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED with the teeth bristle-pointed and the hollows between rounded.

Outline, very narrow oval. *Base* and *Apex* taper-pointed.

Leaf, four to eight inches long, two to three inches wide; smooth above and below; with straight ribs terminating in the bristle-teeth.

Bark of trunk grayish and in young trees very smooth.

Fruit, with large bristly husks. Usually there are two or three nuts pressed closely in each cell, and therefore flat on one or both sides. The nut, though smaller, is sweeter and more delicate than in the European variety, the "Spanish Chestnut."

Found, from Southern Maine to Delaware and Southern Indiana; southward along the Alleghany Mountains and west to Middle Kentucky and Tennessee. Its finest growth is on the western slopes of the southern Alleghany Mountains.

A tree fifty to eighty feet high or more, with light, soft wood, largely used in cabinet-work, for railway ties, posts, etc.

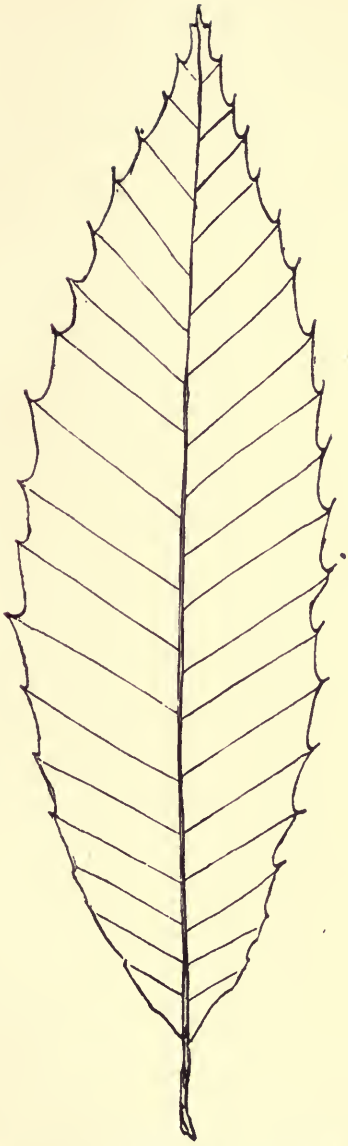

Fig. 34.—Chestnut. C. Sativa (L.), var. Americàna (Michaux), Sarg.
NATURAL SIZE.

Genus FAGUS, L. (Beech.)

Fig. 35.—Beech. *F. ferruginea, Ait.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED, WITH SMALL AND REMOTE TEETH.

Outline, oval or egg-shape. *Apex*, taper-pointed. *Base*, rounded.

Leaf, three to six inches long, about half as wide; a very "finished" leaf; when young, fringed with soft, white hairs; becoming smooth and polished; with distinct and straight unbranched side-ribs, ending in the teeth of the edge. The dead, bleached leaves often cling thickly to the branches throughout the winter.

Bark of the trunk, light gray, smooth, and unbroken.

Fruit, a small four-celled prickly burr, splitting half-way to the base when ripe, and with two sweet, three-sided nuts in each shell.

Found in rich woods, Nova Scotia to Florida and westward, with its finest growth on the "bluffs" of the lower Mississippi basin.

Large stately trees, with spreading branches and a delicate spray, fifty to eighty feet high. The wood is hard and very close-grained, and is used largely in the making of chairs, handles, plane-stocks, shoe-lasts, and for fuel. When the tree is not crowded, it sends out its nearly horizontal or drooping branches as low as from ten to thirty feet above the ground.

Lumber-men make the distinction of "Red Beech" and "White Beech," claiming that the former is harder, with a redder and thicker heart-wood.

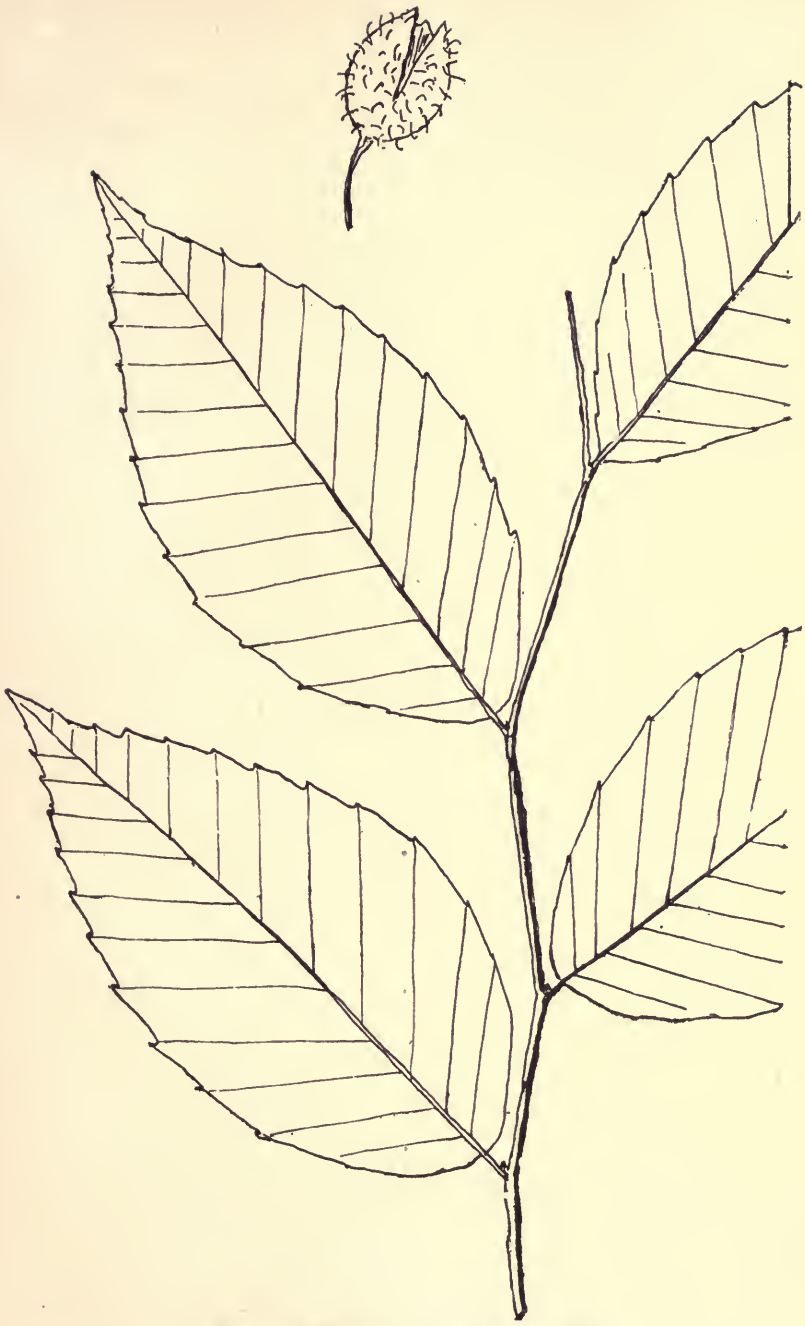

Fig. 35.—Beech. (F. ferruginea, Ait.)
NATURAL SIZE.

Among woodsmen and the Indians, the Beech is said to be a favorite refuge in thunder-storms. They claim that it is scarcely ever struck by lightning.

Lumber-men claim a difference in the quality of trees which retain their leaves and those which shed them. "Said a neighbor to me one day: 'You might 'a knowed that beech would split hard with all the dry leaves on it,"—and it did. That was the first I 'd ever heard of the sign, but I 've never known it fail since."

LIST OF WILLOWS.

(A) Native trees; all small:
- Black Willow (S. nigra, Marshall).
- Scythe-leaved Willow (S. n., var. falcata, Torr.).
- (S. amygdaloides, Anders.).
- Shining Willow (S. lùcida, Muhl.).
- Long-beaked Willow (S. rostrata, Richards).

(B) Not native trees; all large:
- White Willow (S. alba, L.).
- Blue Willow (S. a., var. cærùlea).
- Yellow Willow (S. a., var. vittelìna).
- Weeping Willow (S. Babylonica, Tourn.).
- Crack Willow (S. fragilis, L.).

Genus SALIX, L. (Willow.)

From two Celtic words meaning "near" and "water."

Fig. 36, *a* and *b*.—**Black Willow.** *S. nigra, Marsh.*

Leaves, SIMPLE; ALTERNATE; FINELY AND SHARPLY TOOTHED.

Outline, long and narrow. *Apex*, long, taper-pointed. *Base*, pointed or slightly rounded.

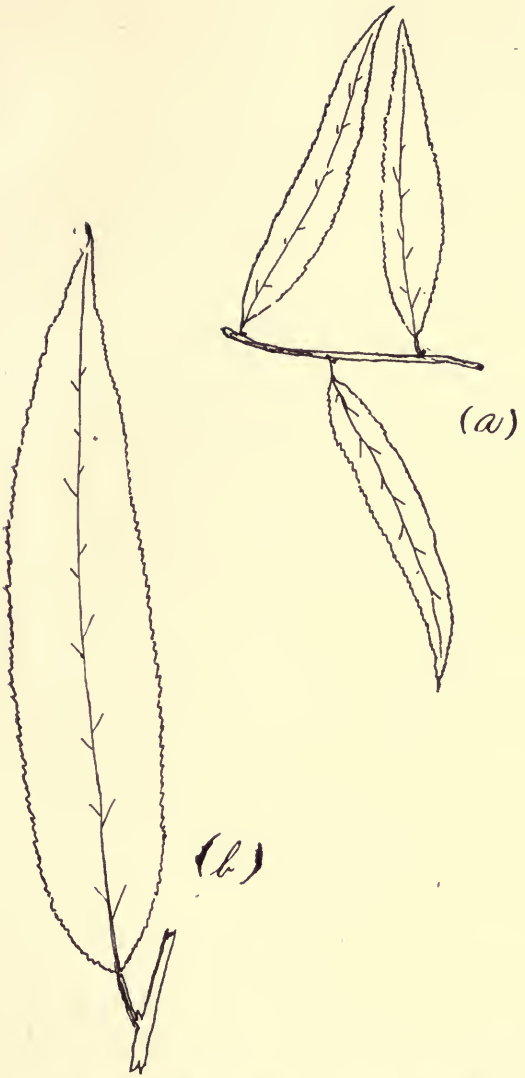

Fig. 36.—Black Willow. (S. nigra, Marsh.)

a. Commonest form. *b*. Large form.

NATURAL SIZE.

Leaf-stem, short and *woolly*.

Leaf, one and a half to four inches long; commonest length about two inches (Fig. 33, *a*); downy when young, becoming smooth excepting on the upper side of the mid-rib, which is usually woolly.

Bark of trunk, dark and rough; branches very brittle at the base and yellowish; twigs tough and purplish or yellow.

Found, in Southern New Brunswick and Ontario, and from Northern Vermont southward. Common on low ground, especially in New York and Pennsylvania.

A small tree, fifteen to twenty feet high; quite variable in the style of its foliage; the latest to flower, in May.

S. amygdaloides, *Anders.* (sometimes considered a variety of S. nigra) is found on the shores of the Great Lakes and westward.

Fig. 37.—Scythe-leaved Willow. *S. nigra, var. falcàta, Torr.*

Leaves, SIMPLE; ALTERNATE; EDGE VERY FINELY SHARP-TOOTHED.

Outline, long and narrow, often "scythe-shaped." *Apex*, long, taper-pointed. *Base*, gradually narrowing and pointed or slightly rounded.

Leaf-stem, short. *Stipules* (two small, leaf-like appendages at the base of the leaf-stem), *not falling off when young*, as in most of the willows; *moon-shaped, finely toothed*, wider than long.

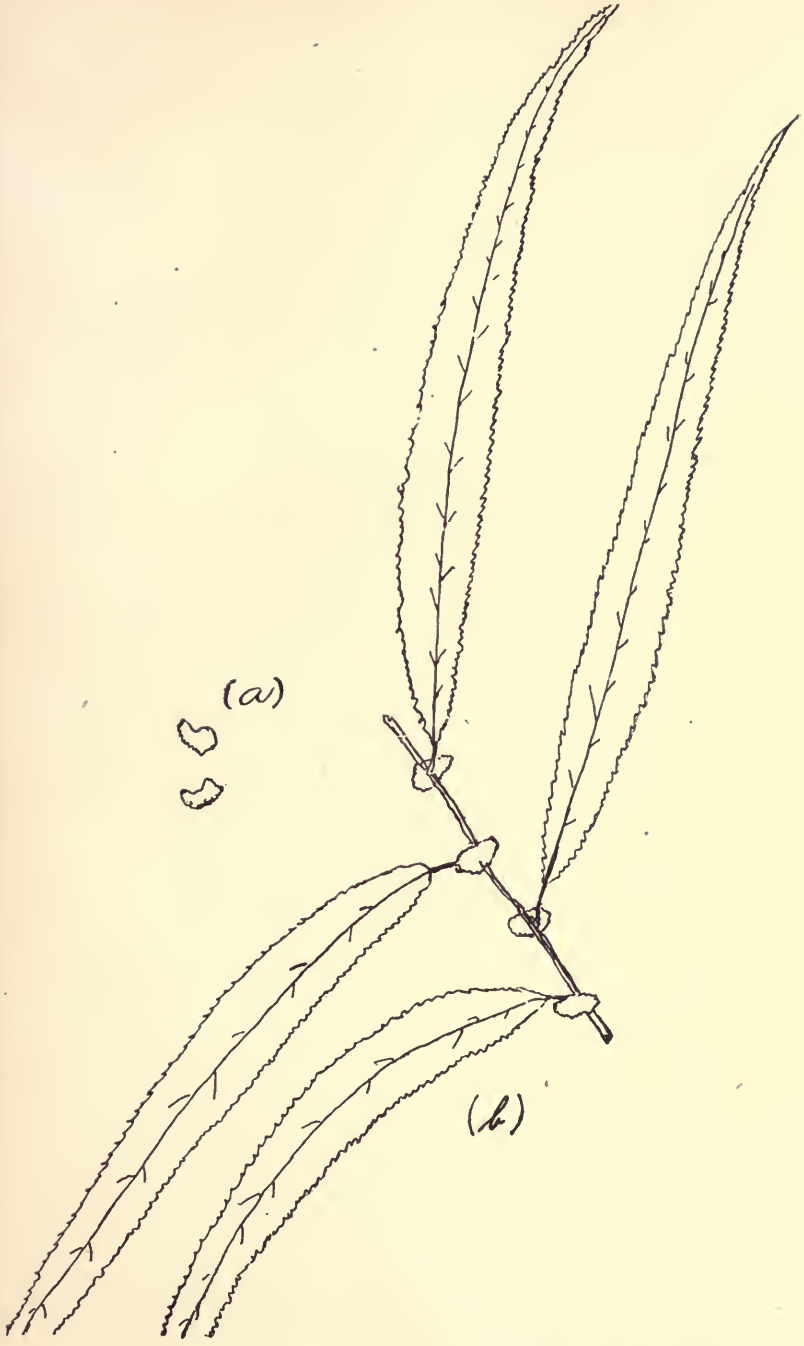

Fig. 37.—Scythe-leaved Willow. (S. r., var. falcàta, Torr.)
a. Stipules. *b*. Leaves.
NATURAL SIZE.

Leaf, four to eight inches long; green and smooth above and below (silky-downy when young).

Found, on low ground from New England to the Middle States and westward.

A small tree (or sometimes a shrub). The persistent stipules and the length of the leaf furnish ready signs for distinguishing it from S. nigra.

Fig. 38.—Shining Willow, Glossy Broad-leaved Willow. *S. lucida, Muhl.*

Leaves, SIMPLE; ALTERNATE; EDGE VERY FINELY AND SHARPLY TOOTHED.

Outline, long egg-shape. Apex, taper-pointed. *Base*, rounded or slightly pointed.

Leaf-stem, about one fourth to one half inch long.

Leaf-buds, yellowish and smooth.

Leaf, about three to five or six inches long, one inch or more wide; dark above, smooth and shining above and below. Middle ribs usually whitish, and distinct above.

Found, from New England southward to Chester County, Pennsylvania, west and north. Rather common, usually on wet grounds.

A small tree (or often a shrub) twelve to twenty-five feet high.

Fig. 38.—Shining Willow. (S. lùcida, Muhl.)
NATURAL SIZE.

Fig. 39.—Long-beaked Willow, Ochre-flowered Willow. *S. rostràta, Richards.*

Leaves, SIMPLE; ALERNATE; EDGE USUALLY OBSCURELY TOOTHED, but varying from quite sharp-toothed to almost entire and slightly wavy.

Outline, oval or reverse egg-shape. *Apex*, sharp (or sometimes rather blunted). *Base*, narrowing to a point (or sometimes slightly rounded).

Leaf, two to four inches long; soft, downy, and almost velvety beneath; smoothish above; ribs distinct.

Bark of trunk, dark colored; of the branches, usually yellow; twigs, reddish-brown, straight and tough, downy when young, becoming smooth.

Found, along borders of woods, and on low grounds, from New England to Pennsylvania, far westward and northward.

A small tree (or sometimes a shrub), four to fifteen feet high.

Fig. 40.—White Willow. [*S. alba, L.*]

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED, with the teeth somewhat thickened.

Outline, narrow lance-shape. *Apex*, taper-pointed. *Base*, pointed.

Leaf, about five inches long, three quarters of an inch wide; surface with white silky hairs beneath, and often above; branches not yellow, and very brittle at the base.

Introduced from Europe, but now common around houses and in low grounds.

Fig. 39.—Long-beaked Willow. (S. rostràta, Richards.)
NATURAL SIZE.

A very large and familiar tree (fifty to eighty feet high), one of the largest of the Willows; low-branching; thick-set, of tough and rapid growth. A stake set in the ground grows readily. The silvery look of the tree (especially in a strong wind) is due to the gloss of its downy leaves.

The *Blue Willow* [var. cærùlea S.] is naturalized in Massachusetts.

Fig. 41.—Yellow Willow, Golden Osier. [*S. alba, var. vitellìna, S. and B.*]

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED, with the teeth somewhat thickened.

Outline, narrow lance-shape. *Apex*, taper-pointed; in the *young leaves* often *broad and rounded.* *Base*, pointed.

Leaf, small (two to three and a half inches long; about one half to five eighths of an inch wide); surface with white, silky hairs beneath and often above, especially in the young leaves.

Branches, brittle at the base, smooth and shining and *yellow.*

Blossoms, in May.

Introduced, from Europe, but now found throughout the United States. Common around houses and in low grounds.

A broad-spreading tree (thirty to forty feet high), branching low, and with the branchlets thick and rather erect. The tree has a *yellowish look*, due to the color of its twigs and branches.

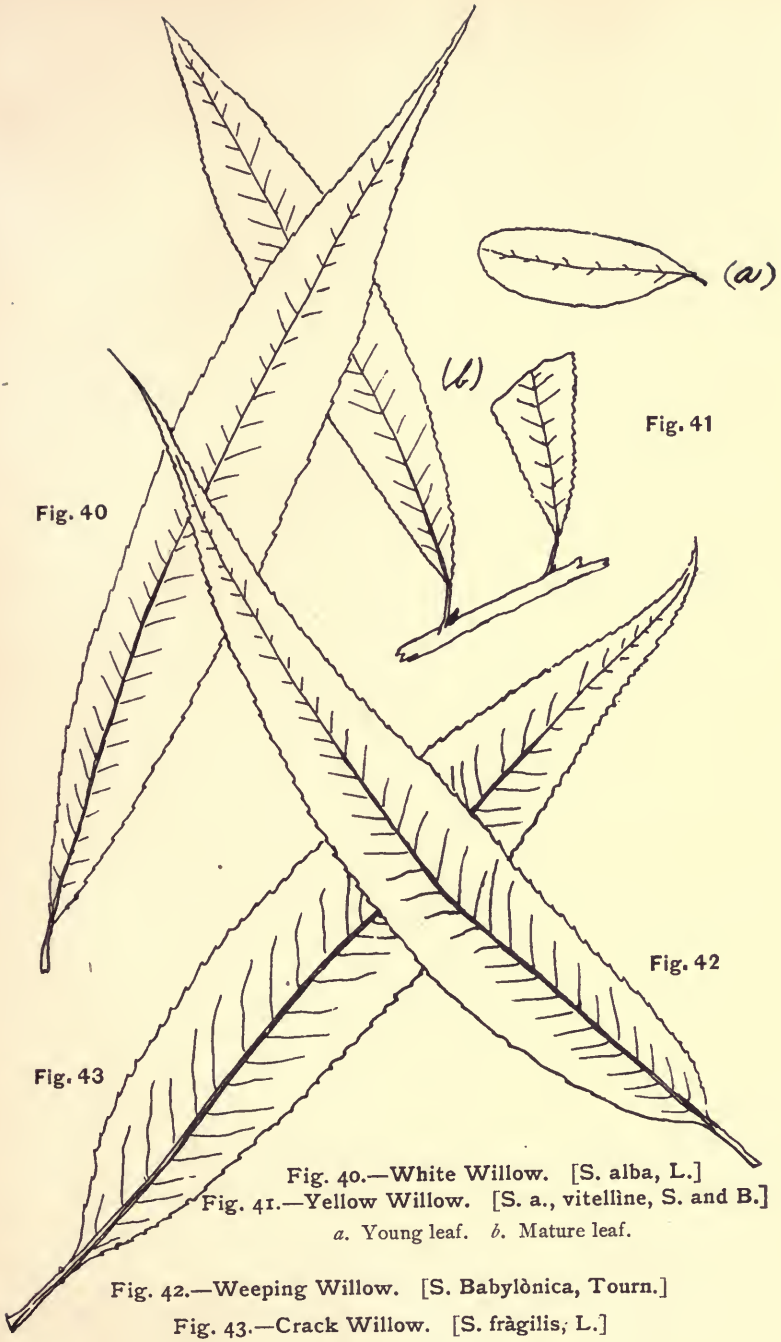

Fig. 40.—White Willow. [S. alba, L.]
Fig. 41.—Yellow Willow. [S. a., vitellìne, S. and B.]
a. Young leaf. *b*. Mature leaf.

Fig. 42.—Weeping Willow. [S. Babylònica, Tourn.]
Fig. 43.—Crack Willow. [S. fràgilis, L.]
NATURAL SIZE.

"The French, finding their native forests giving out, took to planting a species of willow, *Salix vitellìna*, largely for hoops. So successful have they been that, besides raising all they want for their own use, they now export largely to British markets. Scotch herring barrels are chiefly bound with French willow hoops."

Fig. 42.—Weeping Willow. [*S. Babylònica, Tourn.*]

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED.

Outline, narrow lance-shape. *Apex*, taper-pointed. *Base*, pointed.

Leaf, about five inches long by three fourths of an inch wide; somewhat silky, or smooth.

Branches and branchlets, very long, curved, and drooping nearly to the ground.

Introduced, from Europe, now common, and much used in ornamental cultivation.

A tree thirty to forty feet high.

The Latin name (Babylònica) was suggested by the lament of the Hebrews, in the 137th Psalm.

"By the rivers of Babylon there we sat down:
Yea we wept when we remembered Zion.
We *hanged our harps upon the willows* in the midst thereof."

Fig. 43.—Crack Willow. [*S. fràgilis, L.*]

Leaves, SIMPLE.; ALTERNATE; EDGE STRONGLY AND SOMEWHAT UNEVENLY TOOTHED, the teeth thickened and their points slightly incurved, so as to appear somewhat blunted.

Outline, narrow lance-shape. *Apex*, taper-pointed. *Base*, taper-pointed.

Leaf-stem, smooth, with *two small warts* on the upper side near the base of the leaf.

Leaf, about five or six inches long, about seven eighths of an inch wide; dark and smooth above; lighter and smooth below (slightly silky when young).

Branches, smooth, shining, and greenish; very brittle at the base, cracking off almost "at a touch."

Introduced, from Europe.

A tree sometimes sixty to eighty feet high, with a bushy head and irregular branches. Its withes are used for basket-work.

"The greene willow boughes with the leaves may very well be brought into chambers and set about the beds of those that be sicke of agues, for they do mightily coole the heate of the aire, which thing is a wonderfull refreshing to the sicke patients."—GERARDES' HERBAL.

Genus POPULUS, L. (Aspen, Poplar.)

From a Latin word meaning the people; either because the tree was often planted along public walks, or on account of the restlessness of its leaves.

Fig. 44.—Aspen, White Poplar. *P. tremulòides, Michx.*

Leaves, SIMPLE; ALTERNATE; EDGE SHARP-TOOTHED, with rounded hollows between.

Outline, rounded. *Apex,* short, sharp-pointed. *Base,* slightly heart-shaped.

Leaf-stem, slender and very much flattened sidewise.

Leaf, two to two and a half inches wide, and usually about one half inch shorter than wide; dark green; smooth on both sides when mature, with a slight down on the edge. Ribs distinct above and below and whitish.

Bark of trunk, greenish-white and smooth, often with blotches of very dark brown, especially under the ends of the branches. The bark is exceedingly bitter.

Found, from Northern Kentucky and the mountains of Pennsylvania northward to Hudson Bay and Newfoundland, northwest to the Arctic Ocean, and along the Rocky Mountain slopes. It is the most widely distributed of North American trees.

A tree twenty to fifty feet high, with white, soft wood that is largely used in place of rags in making coarse paper. The tremulousness of its foliage, which the slightest breeze stirs, is due to the thinness of the sidewise-flattened leaf-stems.

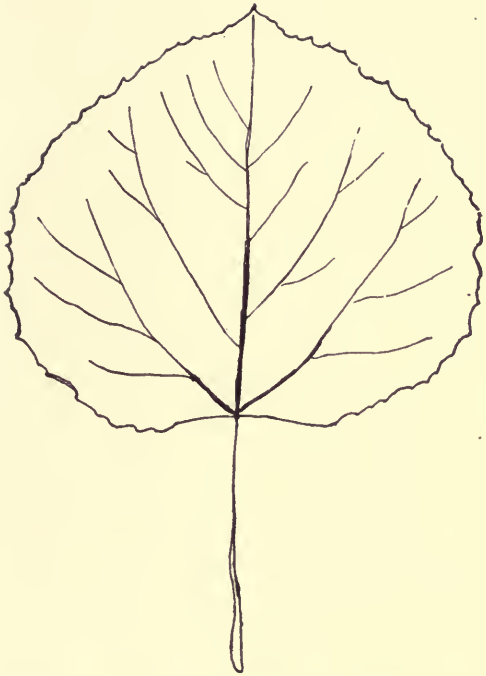

Fig. 44.—Aspen. (P. tremuloides, Michx.)
NATURAL SIZE.

Tradition accounts differently for the motion of the leaves. It says that the wood of the aspen tree was taken for the Saviour's cross, and that, ever since, the tree has shivered.

Another tradition claims that, when Christ went by on his way to Calvary, all the trees sympathized and mourned, excepting the aspen; but when he died, there fell upon the aspen a sudden horror of remorse, and such a fearful trembling as has never passed away.

In describing the occupations of the fifty maidens in the hall of the "gorgeous palace" of King Alcinous, Homer says:

> ". . . some wove the web
> Or twirled the spindle, sitting, with a quick
> Light motion *like the aspen's glancing leaves.*"

Fig. 45.—Large-toothed Aspen. *P. grandidentàta, Michaux.*

Leaf, SIMPLE; ALTERNATE; EDGE LARGE-TOOTHED, with the hollows rounded.

Outline, wide egg-shape. *Apex*, sharp-pointed. *Base*, squared, or slightly rounded.

Leaf-stem, long and slender, and flattened sidewise.

Leaf, three to five inches long, smooth on both sides when mature; white, and covered thickly with silky wool when young. Ribs, whitish and distinct above.

Bark of the trunk, smooth, and of a soft, light greenish-gray; when old, becoming somewhat cracked. On the young branches the bark is dark.

Found, in Nova Scotia and New Brunswick, through the Northern States, along the Alleghany Mountains to North Carolina, and west to Wisconsin and Iowa. Rare at the South, common at the North.

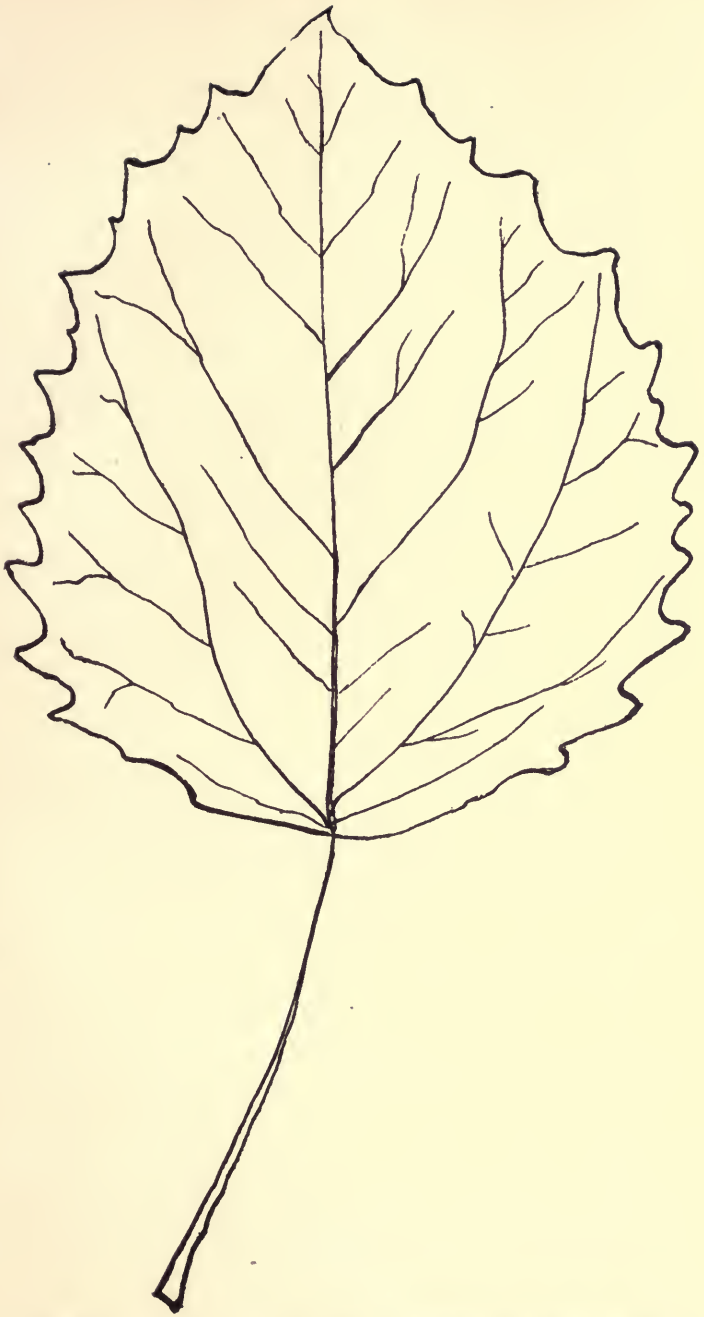

Fig. 45.—Large Toothed Aspen. (P. grandidentàta, Michx.)
NATURAL SIZE.

A tree forty to eighty feet high, with open, crooked branches. Large quantities of the soft, white wood are ground into pulp for making paper. "In both this and the preceding species, the leaves of young sprouts are often differently shaped and toothed, and much enlarged."—(Porter.)

Poplar wood, like other soft woods, is not usually esteemed for durability; but an old couplet, said to have been found inscribed on a poplar plank, teaches differently:

"Though 'heart of Oak' be e'er so stout,
Keep me dry, and I'll see him out."

Fig. 46.—Downy-leaved Poplar, River Cottonwood, Swamp Cottonwood. *P. heterophylla, L.*

Leaves, SIMPLE; ALTERNATE; EDGE TOOTHED.

Outline, roundish egg-shape. *Apex*, usually *blunt (never taper-pointed)*. *Base*, heart-shape, sometimes with the lobes so *close* or overlapping as to cover the end of the leaf-stem.

Leaf-stem, nearly round.

Leaf, three to six inches long (on young sprouts, eight to ten inches); when young, thickly covered with white down; becoming smooth, except on the ribs below.

Found, in borders of swamps, from Long Island southward to Southern Georgia, through the Gulf States to Western Louisiana, and northward to Southern Illinois and Indiana. Rare and local.

A tree sixty to eighty feet high.

Fig. 46.—Downy-leaved Poplar. (P. heterophylla, L.)
NATURAL SIZE.

Fig. 47.—Cottonwood, Poplar, Necklace Poplar, River Poplar.
P. monilìfera, Ait. P. angulàta, Ait.

Leaves, SIMPLE; ALTERNATE; EDGE SOMEWHAT IRREGULARLY TOOTHED.

Outline, broad egg-shape (approaching triangular-shape). *Apex*, long, taper-pointed. *Base*, squared, slightly hollowed, or slightly pointed.

Leaf-stem, long and slender and much compressed sidewise.

Leaf, two to three and a half inches long (much larger on young shoots); length and width nearly the same; smooth; ribs distinct and whitish on both sides, irregular, and branching.

Bark of trunk, light "granite-gray," smooth on young trunks, becoming somewhat rough with age, and with rounded up-and-down furrows. New and vigorous shoots are green, and marked with short white or brownish lines.

Seeds, covered with a white, cotton-like fibre.

Found, from Western New England southward to Western Florida, westward to the Rocky Mountains. The common "cottonwood" of the West, bordering all streams flowing east from the Rocky Mountains.

A tree eighty to one hundred feet high. The very light and soft wood is largely used in making paper pulp, for light boxes, and for fuel.

Experiments have been made in separating and weaving the cottony fibre of the poplar seeds. It can be manufactured into cloth, but not in paying quantity and quality.

Fig. 47.—Cottonwood. (P. monilifera, Ait.)
NATURAL SIZE.

Fig. 48.—Balsam Poplar, Tacamahac. *P. balsamìfera, L.*

Leaves, SIMPLE; ALTERNATE; EDGE FINELY AND RATHER SHARPLY TOOTHED.

Outline, egg-shape. *Apex*, taper-pointed. *Base*, rounded.

Leaf-stem, nearly smooth, the lower half *rounded*, the upper part only *slightly* flattened. The *leaf-buds* in the spring are large and yellow, and covered with a fragrant gum (as, to some extent, are the buds of most of the poplars).

Leaf, four to six inches long; when young, yellowish above, becoming bright green; whitish, and "net-veined" below; smooth.

Found in Northern New England, Central Michigan, and Minnesota, and far northward.

A tree sixty to seventy feet high, with very light and soft wood.

Fig. 49.—Balm of Gilead, Heart-leaved Balsam Poplar. *P. balsamìfera, var. càndicans (Ait.), Gray.*

Leaves, SIMPLE; ALTERNATE; EDGE TOOTHED.

Outline, egg-shape. *Apex*, taper-pointed. *Base*, heart-shape.

Leaf-stem, usually hairy, nearly round. The *leaf-buds* in the spring are large and varnished, and very fragrant.

Leaf, four to six inches long, nearly as broad; yellowish when young, becoming dark green above, and whitish beneath; net-veined.

Bark, smooth and greenish, and often dark-spotted.

Found, seldom or never growing wild, but common in cultivation.

A tree forty to fifty feet high, loosely and irregularly branched, and with abundant foliage.

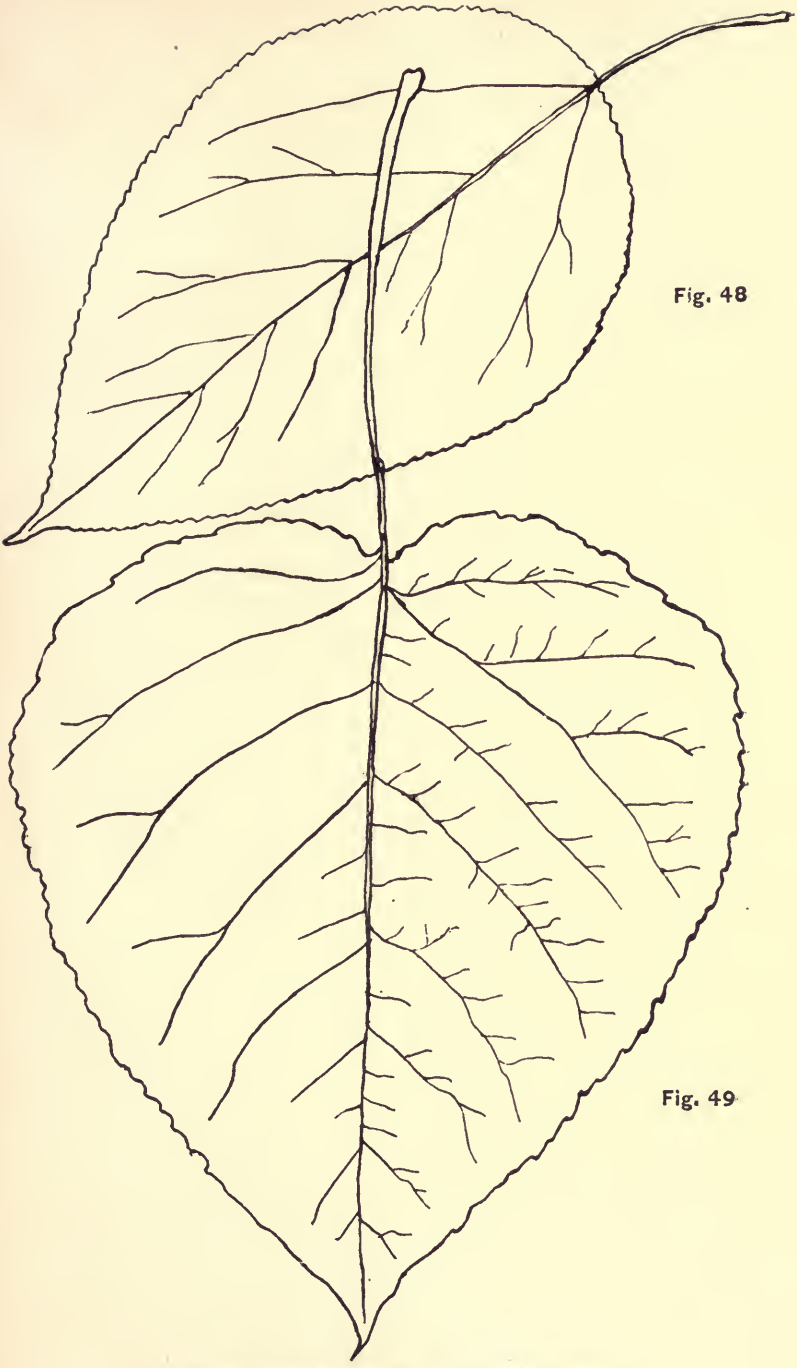

Fig. 48

Fig. 49

Fig. 48.—Balsam Poplar. (P. balsamìfera, L.)
Fig. 49.—Balm of Gilead. P. b. càndicans (Ait.), Gray.
NATURAL SIZE.

Fig. 50.—Lombardy Poplar. [*P. dilatàta, Ait.*]

Leaves, SIMPLE; ALTERNATE; EDGE TOOTHED.

Outline, very broad oval (approaching diamond shape). *Apex*, pointed. *Base*, pointed.

Leaf-stem, flattened sidewise.

Leaf, usually about two inches long, width and length about the same.

Introduced about one hundred years ago from Italy, and now often found in old settlements.

A tall and very slender tree, with crowded, perpendicular branches.

Fig. 51.—Silver-Leaf Poplar, Abele, White Poplar. [*P. alba, L.*]

Leaves, SIMPLE; ALTERNATE; EDGE USUALLY LOBED (the lobes toothed).

Outline, broad egg-shape. *Base*, usually slightly heart-shaped. *Apex* of the lobes, blunt-pointed.

Leaf-stem, downy and nearly round.

Leaf, usually about two and a half inches long; when mature, smooth and dark green above, below downy and almost snow-white. In the young leaves both surfaces and the leaf-stem are snowy-white and downy.

A native of Europe; now widely introduced.

A very ornamental tree, but troublesome in cultivation, and now out of favor because of the abundance of suckers that spring from its roots.

NOTE.—See *Chestnut Oaks* with their genus under Sec. A, *III. (a)*,

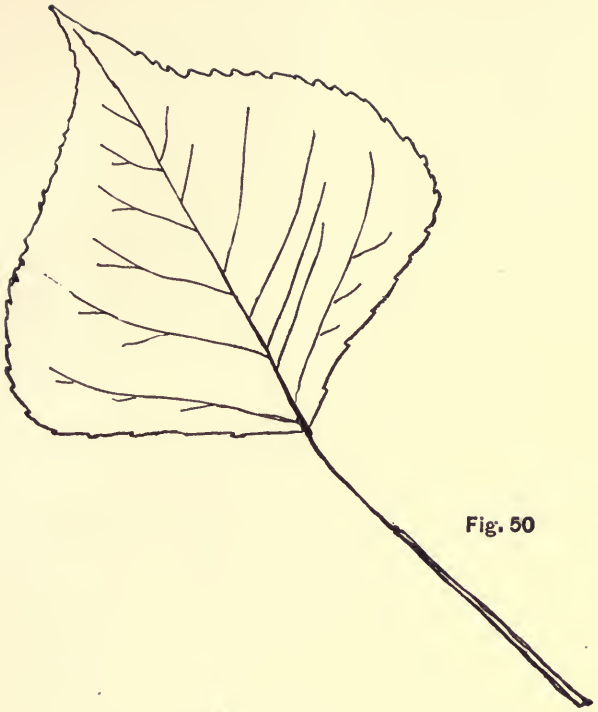

Fig. 50

Fig. 51

Fig. 50.—Lombardy Poplar. [P. dilatàta, Ait.]
Fig. 51.—Silver-Leaf Poplar. [P. alba, L.]
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

LEAVES ALTERNATE

CONTINUED

(EDGE LOBED)

A III

(a) and (b)

Genus LIRIODÈNDRON, L. (Tulip Tree.)

From two Greek words meaning lily and tree.

Fig. 52.—Tulip Tree, Whitewood, Yellow Poplar.* *L. tulipìfera, L.*

Leaves, SIMPLE; ALTERNATE; EDGE LOBED (lobes entire).

Outline, rounded. *Apex*, cut almost squarely across, with a shallow hollow, giving a square look to the upper half of the leaf. *Base*, usually heart-shape.

Leaf, three to five inches long and wide; very smooth; with four to six lobes (two lobes at the summit; at the sides two, or two large and two small).

Bark of trunk, dark ash-color and slightly rough.

Flowers, four to six inches across; greenish-yellow, marked within with orange; somewhat tulip-like, fragrant, solitary. May, June.

Found, from Southwestern Vermont to Michigan, southward and westward. Its finest growth is in the valley of the lower Wabash River and along the western slopes of the Alleghany Mountains.

Among the largest and most valuable of the North American trees. It is usually seventy to one hundred

* The name should be dropped. The tree is not a poplar.

Fig. 52.—Tulip Tree. (L., tulipĭfera, L.)
NATURAL SIZE.

feet high, often much higher, with a straight, clear trunk, that divides rather abruptly at the summit into coarse and straggling branches. The wood is light and soft, straight-grained, and easily worked, with the heart wood light yellow or brown, and the thin sap wood nearly white. It is very widely and variously used—for construction, for interior finish, for shingles, in boat-building, for the panels of carriages, especially in the making of wooden pumps and wooden ware of different kinds.

I asked a carpenter: "Hope, is n't it the tulip wood (which you call poplar) that the carriage-makers use for their panels?"

"Yes, and the reason is, because it shapes so easily. If you take a panel and wet one side, and hold the other side to a hot stove-pipe, the piece will just hug the pipe. It 's the best wood there is for panelling."

"Of all the trees of North America with deciduous leaves, the tulip tree, next to the buttonwood, attains the amplest dimensions, while the perfect straightness and uniform diameter of its trunk for upwards of forty feet, the more regular disposition of its branches, and the greater richness of its foliage, give it a decided superiority over the buttonwood and entitle it to be considered as one of the most magnificent vegetables of the temperate zone."—MICHAUX.

The tulip tree was very highly esteemed by the ancients; so much so that in some of their festivals they are said to have honored it by pouring over its roots libations of wine.

GUIDE TO THE OAKS.

SECTION I.—Leaves, *not* sharp-pointed * or bristle-tipped. Fruit, annual.

A. Leaves, deeply lobed, with the ends of the lobes and the hollows rounded. Pp. 102–106. (The White Oaks.)

B. Leaves, wavy-toothed.* Pp. 108–112. (The Chestnut Oaks.)

SECTION II.—Leaves, sharp-pointed or bristle-tipped. Fruit, biennial.

A. Leaves, abruptly widening above and slightly lobed, lobes rounded † and bristle-tipped. P. 114. (Black Jack.)

B. Leaves, deeply lobed; the ends of the lobes sharp and bristle-tipped.

(1) Mature leaves downy beneath. P. 116. (Spanish Oak.)

(2) Mature leaves smooth on both sides, or nearly so. Acorn-cup with coarse scales and more or less top-shaped, and covering one third or nearly one half of the nut. Pp. 118–122. (Scarlet Oak and Black Oak.)

(3) Mature leaves smooth on both sides, or nearly so. Acorn-cup with fine scales, shallow, saucer-shape, much shorter than the nut. Pp. 122–124. (Red Oak and Pin Oak.)

C. Leaves, entire, very narrow, pointed, and bristle-tipped. Pp. 126–128. (The Willow Oaks.)

* Excepting yellow Chestnut Oak, which is usually sharp-toothed.

† Excepting sometimes Black Jack.

Genus Quercus, L. (Oak.)

Possibly from a Celtic word meaning to inquire, because it was among the oaks that the Druids oftenest practised their rites.

Fig. 53.—White Oak. *Q. alba, L.*

Leaves, SIMPLE; ALTERNATE; EDGE LOBED; (edge of the lobes entire or sometimes coarsely notched and hollowed at their ends.)

Outline, reverse egg-shape. *Base*, wedge-shape. *Apex* of lobes, rounded.

Leaf, quite variable in size and shape; four to seven inches long; smooth; pale beneath; the *lobes* oftenest five to nine, long and narrow, and sometimes widening toward the end, but at other times only three to five, short and broad, and radiating obliquely from the middle rib.

Bark of trunk, slightly roughened (comparatively smooth for an oak), light-gray; in older trees loosening in large, thin scales; the inner bark white.

Acorns, usually in pairs on a stem one fourth of an inch or more in length. *Cup*, rounded saucer-shape, not scaly, but rough and warty and much shorter than the nut. *Nut*, three fourths to one inch long, slightly egg-shape or oval; brown, sweet, and edible. October.

Found, from Ontario and the valley of the St. Lawrence southward to Florida, and westward to Southeastern Minnesota, Arkansas, and Texas. Its finest growth is on the western slopes of the Alleghany Mountains, and in the Ohio basin.

A noble tree, sixty to eighty feet or more in height, with hard, tough wood of very great value in many kinds of manufacturing, and for fuel. The withered, light-brown leaves often cling throughout the winter.

Fig. 53.—White Oak. (Q. alba, L.)
LEAVES AND FRUIT REDUCED ONE FOURTH.

The "oak-apples" or "galls" often found on oak-trees are the work of "gall-flies" and their larvæ. When green, tiny worms will usually be found at their centre. Quaint reference is made to these galls in Gerardes' "Herbal":

"Oak-apples being broken in sunder before they have an hole thorough them do fore shewe the sequell of the yeere. If they conteine in them a flie, then warre insueth; if a creeping worme, then scarcitie of victuals; if a running spider, then followeth great sickness or mortalitie."

The oak, probably more than any other tree, has been associated with worship of the gods. The "Talking Tree" of the sanctuary in Dodòna (the oldest of all the Hellenic sanctuaries, and second in repute only to that at Delphi) was an oak. Oak groves were favorite places for altars and temples of Jupiter. The Druids worshipped under the oak-trees.

Fig. 54.—Post Oak, Iron Oak, Rough-leaved White Oak.
Q. minor (Marsh), Sarg. Q. obtusilòba, Michx.

Leaves, SIMPLE; ALTERNATE; EDGE LOBED (edge of the lobes entire, or sometimes hollowed more or less deeply at the ends).

Outline, usually broad, reverse egg-shape or oval. *Base*, wedge-shape or round. *Apex* of lobes, rounded.

Leaf, four to six inches long; *rough* above and below; thick and coarse. The *lobes*, five to seven and exceedingly variable in size and shape, *radiating almost at right angles* from the middle rib; sometimes broad and squared, sometimes much narrowed toward their base, with the spreading ends themselves lobed or hollowed; often irregularly and unequally placed.

Bark of the trunk, resembling that of the white oak, but rather darker. Inner bark white.

Fig. 54.—Post Oak. Q. minor (Marsh), Sarg.
LEAVES AND FRUIT REDUCED ONE FOURTH.

Acorns, two to three together on a short stem (about one fourth inch), or single and nearly stemless. *Cup*, round saucer-shape, rather thin, with very small scales, not warty. *Nut*, about one half inch long; egg-shape or oval; more than one third covered by the cup; shining blackish-brown, and often slightly striped; very sweet.

Found, from the coast of Massachusetts southward and westward.

A tree twenty to fifty feet high, of value, especially in the Southwestern States, where it is very common.

Fig. 55.—Burr Oak, Mossy-cup Oak, Over-cup White Oak.
Q. macrocàrpa, Michx.

Leaves, SIMPLE; ALTERNATE; LOBED (the edge of the lobes entire, or of the larger ones sometimes wavy).

Outline, reverse egg-shape. *Base*, wedge-shape. *Apex* of the lobes, rounded.

Leaf, six to fifteen inches long (the longest of the oak-leaves); smooth above, downy beneath; the lobes usually long and rather irregular, the middle ones longest and often extending nearly to the middle rib.

Bark of the young branches always marked with corky wings or ridges.

Acorns, large, with short stems. *Cup*, two thirds to two inches across, roughly covered with pointed scales, and heavily fringed around the nut. *Nut*, very large (one to one and a half inches long); broad egg-shape; one half to two thirds or often wholly enclosed by the cup.

Found, along the coast of Maine southward as far as the Penobscot, in Western New England, in Western New York, in Pennsylvania, and thence westward to the foot-hills of the Rocky Mountains of Montana,

Fig. 55.—Burr Oak. (Q. macrocàrpa, Michx.)
LEAVES AND FRUIT REDUCED ONE FOURTH.

and from Central Nebraska and Kansas southwest to the Indian Territory and Texas.

It is found farther west and northwest than any other oak of the Atlantic forests. In the prairie region it forms the principal growth of the "Oak Openings."

One of the most valuable and widely distributed oaks of North America, growing sixty to eighty feet in height, or more, with hard, tough wood resembling that of the White Oak.

"The most interesting thing about this tree, perhaps, is its power, quite unknown in the other White Oaks, of adapting itself to very different climatic conditions, which enables it to live in the humid climate of Maine and Vermont, to flourish in the somewhat drier climate of the Mississippi Valley, and to exist [still farther west] in the driest and most exposed region inhabited by any of the Eastern American oaks."—SARGENT.

Q. m. olivæfŏrmis is a variety found only in a few districts (near Albany and in Pennsylvania), having narrower and rather more deeply lobed leaves.

Fig. 56.—Swamp White Oak. *Q. bĭcolor, Willd. Q. prinus, var. discolor, Michx.*

Leaves, SIMPLE; ALTERNATE; EDGE QUITE DEEPLY WAVY-TOOTHED.

Outline, reverse egg-shape or oval. *Apex*, blunt-pointed. *Base*, pointed.

Leaf, five to eight inches long; smooth, and rather bright green above; *whitish-downy beneath*, becoming almost silvery-white; often with a rather deep hollow just below the middle, and usually abruptly spreading above; the teeth unequal, longest toward the middle of the leaf, sometimes almost long enough

Fig. 56.—**Swamp White Oak.** (Q. bicolor, Willd.)
NATURAL SIZE.

to be called lobes; mostly rounded at the apex, but sometimes ending in a hard point; the main ribs prominent and rust-colored.

Bark of trunk, grayish-white, dividing into large, flat scales.

Acorns, usually in pairs on a stem one and a quarter to three inches long. *Cup*, rounded, rather thin, rough, with sharp scales; the upper scales bristle-tipped, forming a border, or sometimes a fringe, along the edge; slightly downy within. *Nut*, one inch or less in length, egg-shape; sweet. October.

Found from Southern Maine and the Upper St. Lawrence to Southeastern Iowa and Western Missouri, south to Delaware and along the Alleghany Mountains to Northern Georgia; along borders of streams and in swamps, in deep, rich soil. Its finest growth is in the region of the Great Lakes.

A tree thirty to sixty feet high or more, with wood similar in value to that of the White Oak.

Fig. 57.—Chestnut Oak, Swamp Chestnut Oak, Rock Chestnut Oak. *Q. prinus, L. Q. prinus, var. monticolor, Michx.*

Leaves, SIMPLE; ALTERNATE; EDGE COARSELY AND EVENLY WAVY-TOOTHED.

Outline, reverse egg-shape or sometimes oval. *Apex*, blunt-pointed. *Base*, rounded or slightly pointed, and often somewhat unequal.

Leaf, four to seven inches long, two to four inches wide; smooth above, paler and downy beneath. *Teeth*, twelve to twenty-six, decreasing evenly and uniformly to the apex.

Bark of trunk, gray; furrowed up and down with continuous and often very deep furrows, with sharp ridges between.

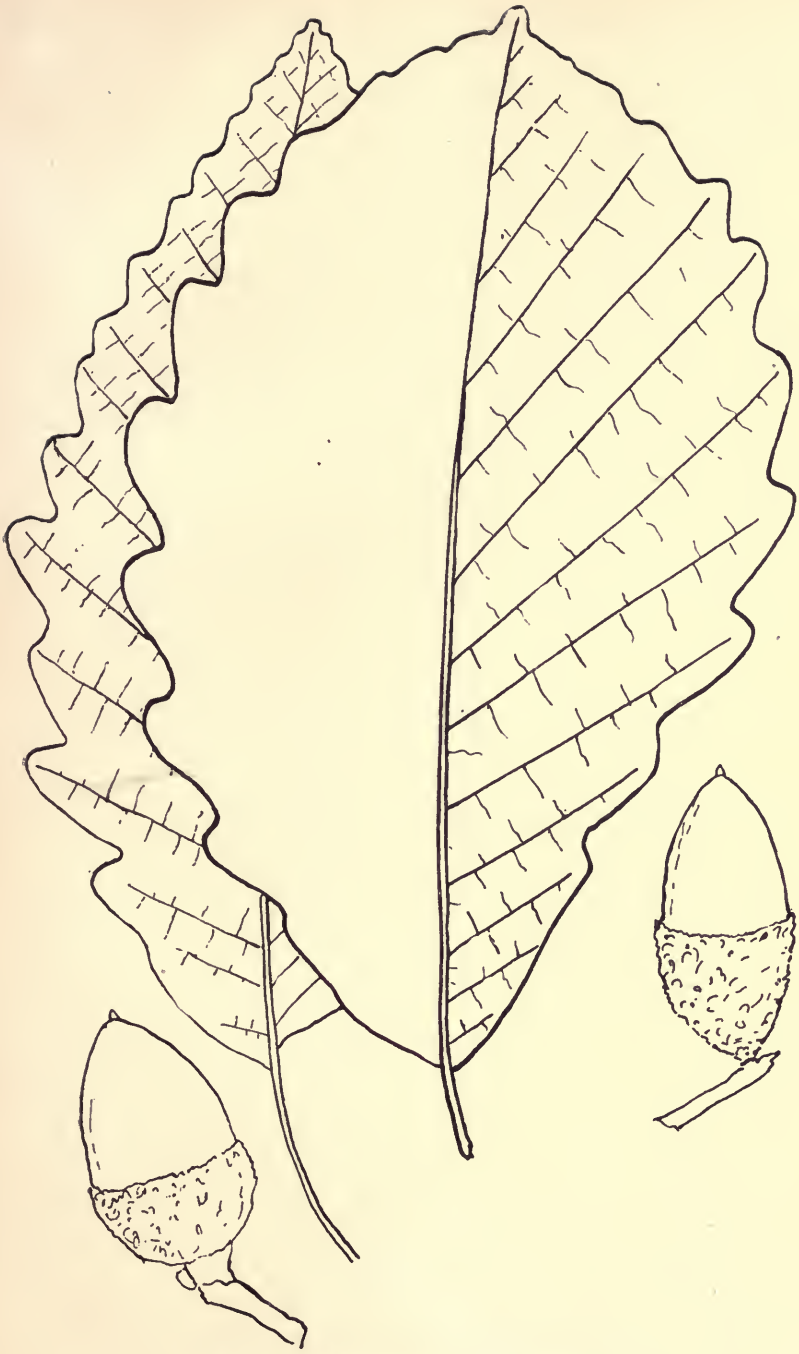

Fig. 57.—Chestnut Oak. (Q. prinus, L.)
NATURAL SIZE.

Acorns, usually in pairs on a stem about one half of an inch long, or often shorter. *Cup*, rounded or somewhat top-shaped, with minute scales, or warty. *Nut*, usually long egg-shape or long oval; one to one and one fourth inches long; brown; about one third covered by the cup; sweet. September, October.

Found, from Eastern Massachusetts to New York, southward to Delaware, along the Alleghany Mountains to Alabama and westward to Central Kentucky and Tennessee.

A tree forty to seventy feet in height, with strong, hard wood, largely used in fencing, for railroad ties, etc.; of less value than that of the White Oak. Its bark is very rich in tannin.

Fig. 58.—Yellow Chestnut Oak, Yellow Oak. *Q. Muhlenbèrgii, Engel. Q. castànea, Willd.*

Leaves, SIMPLE; ALTERNATE; EDGE EVENLY AND SHARPLY (or sometimes bluntly) TOOTHED.

Outline, very narrow oval (or sometimes wide). *Apex*, taper-pointed. *Base*, pointed or blunt.

Leaf-stem, three fourths to one inch long.

Leaf, usually about five to seven inches long, by one and one half to two inches wide, but sometimes so wide as to resemble the preceding species (*Q. prinus*), from which, however, it is distinguished by its *thin bark*. Of all the "chestnut-oak" leaves it most closely resembles the chestnut leaf. It is smooth above, whitish and minutely downy beneath.

Bark of trunk, light, flaky, and thin.

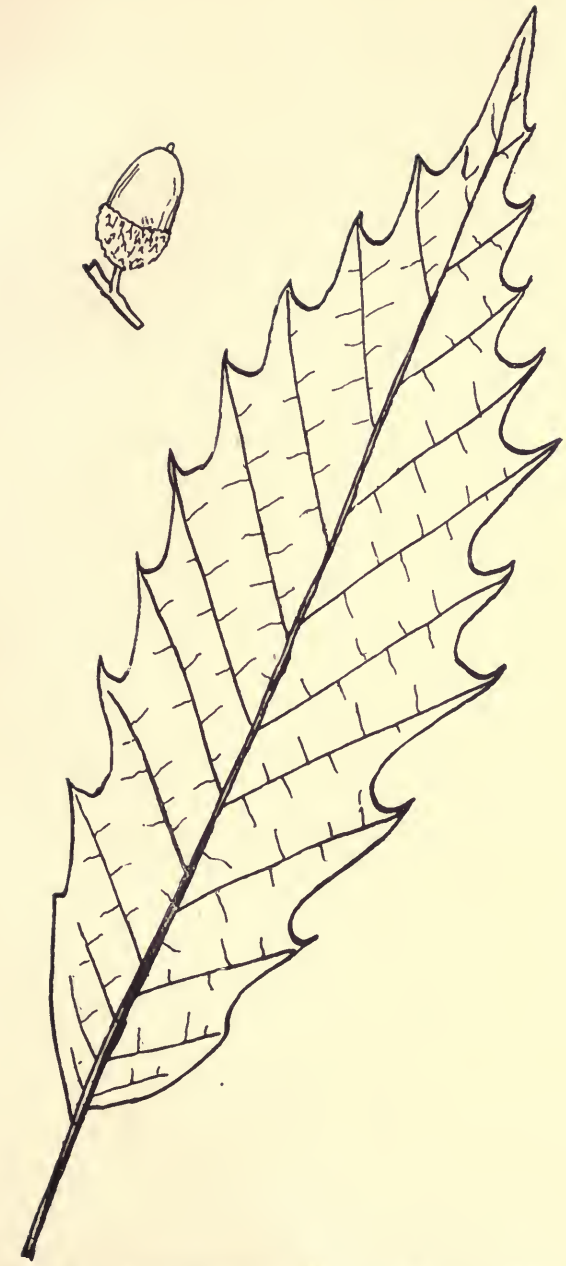

Fig. 58.—Yellow Chestnut Oak. Q. (Muhl.), Engel.
NATURAL SIZE.

Acorn, nearly stemless. *Cup*, about five twelfths to seven twelfths of an inch across; rounded; thin, with very small, closely pressed scales. *Nut*, seven twelfths to nine twelfths of an inch long; egg-shape or narrow oval, light brown, about one third covered by cup; sweet. October.

Found, from Massachusetts to Delaware, along the mountains to Northern Alabama and westward. Very common west of the Alleghany Mountains.

A tree forty to sixty feet high, with strong and durable wood.

Fig. 59.—Black Jack, Jack Oak, Barren Oak. *Q. nigra, L.*

Leaves, SIMPLE; ALTERNATE; EDGE SLIGHTLY LOBED AT THE UPPER PART (edge of the lobes entire).

Outline, abruptly widening above. *Base*, heart-shape or rounded. *Apex* of lobes, rounded or sometimes slightly pointed, and bristle-tipped, at least until old.

Leaf, three to four inches long (on vigorous shoots much longer); dark green, smooth, and shining above; below rusty and roughish, thick and tough; ribs distinct above. *Lobes*, three (sometimes five), very short, and above the middle of the leaf.

Bark of trunk, rough and blackish.

Acorn, nearly or quite stemless. *Cup*, top-shaped, coarsely scaly. *Nut*, one half to two thirds of an inch long; rounded egg-shape; darkish-brown when ripe; nearly one half covered by the cup. October.

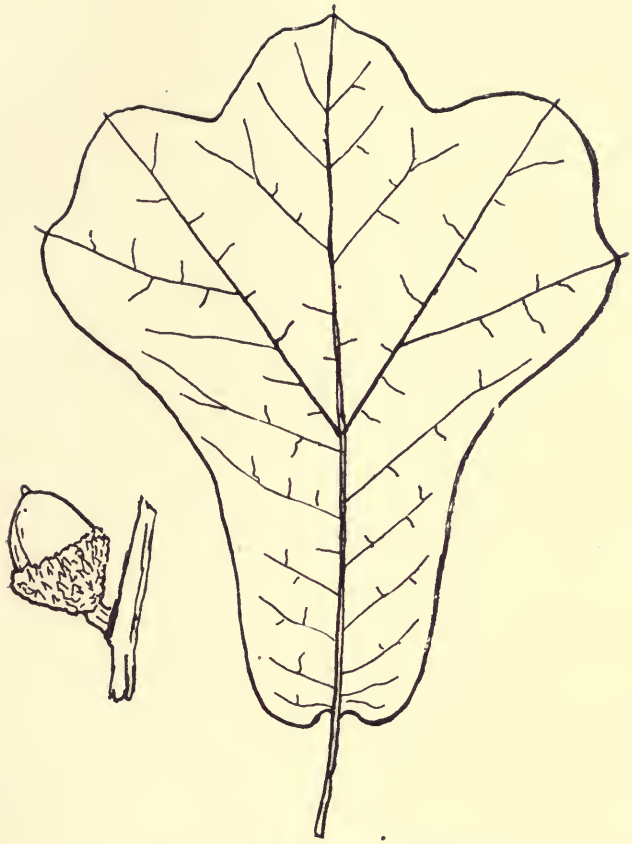

Fig. 59.—Black Jack. (Q. nigra, L.)
NATURAL SIZE.

Found, on Long Island, southward and westward. Very common through the Southern States.

A small tree, eight to twenty-five feet high; of slight value except for fuel.

Fig. 60.—Spanish Oak. *Q. cuneàta, Wang. Q. falcàta, Michx.*

Leaves, SIMPLE; ALTERNATE; EDGE LOBED (the edges of the lobes mostly entire, but often with one to three teeth toward the ends).

Outline, abruptly spreading above the middle. *Base*, rounded, sometimes slightly unequal. Ends of the lobes and of the few teeth, when present, sharp and bristle-tipped.

Leaf, about three to six inches long; dark, dull green, and rough above; below, grayish and downy. Lobes, usually three, sometimes four or five, mostly long and narrow, especially the end one.

Bark of trunk, blackish and deeply grooved.

Acorns, nearly stemless. *Cup*, shallow, somewhat top-shaped. *Nut*, about one third to one half inch long; rounded, sometimes slightly hollowed at the apex; bitter. October.

Found, in sandy soils and barrens, from Long Island southward; in the Northern States, only near the coast and rare.

A tree about twenty to thirty feet high in New Jersey; in the South, seventy to eighty feet; with wood of slight value except for fuel.

Fig. 60.—Spanish Oak. (Q. cuneàta, Wang.)
NATURAL SIZE.

Fig. 61.—Scarlet Oak. *Q. coccìnea, Wang.*

Leaves, SIMPLE; ALTERNATE; EDGE DEEPLY LOBED (edges of lobes mostly entire, but notched and toothed towards the ends).

Outline, broadly oval or broadly reverse egg-shape. *Base*, very short wedge-shape or squared. Ends of the lobes and of the teeth pointed and bristle-tipped.

Leaf, four to eight inches long, bright green above, slightly lighter below; both surfaces smooth and shining. *Lobes*, five to nine, usually seven with the hollows rounded and very broad, and reaching about two thirds of the way to the middle rib. Most of the lobes widen and are deeply notched toward their end.

Bark of trunk, thick and rough, usually not quite as dark or as straight-furrowed as that of the Black Oak. The inner bark *reddish*.

Acorns, variable. *Cup*, very thick, top-shaped, with large, somewhat triangular egg-shaped, scales. *Nut*, one half to three fourths of an inch long; round or rounded egg-shape, about one third covered by the cup; kernel bitter and *whitish*. October.

Found, from Southern Maine southward and westward; most common in the Middle and Southern States.

A tree fifty to ninety feet high, with wood of less value than some of the other oaks. In the fall the leaves turn to a bright scarlet, or orange-scarlet, or crimson and red. They often cling throughout the winter.

Fig. 61.—Scarlet Oak. (Q. coccinea, Wang.)
NATURAL SIZE.

Fig. 62, *a* and *b*.—**Black Oak, Yellow-Bark Oak, Quercitron, Yellow Oak.** *Q. coccìnea, var. tinctòria, Gray. Q. tinctòria, Bar.*

Leaves, SIMPLE; ALTERNATE; EDGE LOBED (edge of the lobes mostly entire, but oftenest with a few teeth toward the end).

Outline, reverse egg-shape or oval. *Base,* usually rounded. Ends of the lobes and of the few teeth, sharp and bristle-pointed, especially when young.

Leaf, five to eight inches long; three to five inches wide; very variable. The two types, *a* and *b*, are often found on the same tree; *b* is a variation toward the leaf of the Scarlet Oak. The upper surface is roughish, becoming smoother when mature; the under surface, rusty-downy until mid-summer, when the down mostly disappears, except from the angles of the ribs.

Bark of trunk, blackish and deeply and roughly furrowed, with an inner bark that is very thick and *yellow* and bitter.

Acorns, variable; usually small; on short stems. *Cup,* thick; somewhat top-shaped; scales distinct and rather large. *Nut,* one half to two thirds of an inch long; rounded; nearly one third covered by the cup. *Kernel,* bright yellow or orange and bitter. October.

Found, from Southern Maine southward and westward. Very common, especially in the Atlantic forests.

A tree fifty to a hundred feet high, with wood that is inferior to that of the White Oak. The yellow inner bark (quercitron of the shops) is a valuable dye, and is rich in tannin. Late in the autumn the leaves turn to a rich yellowish-brown or russet.

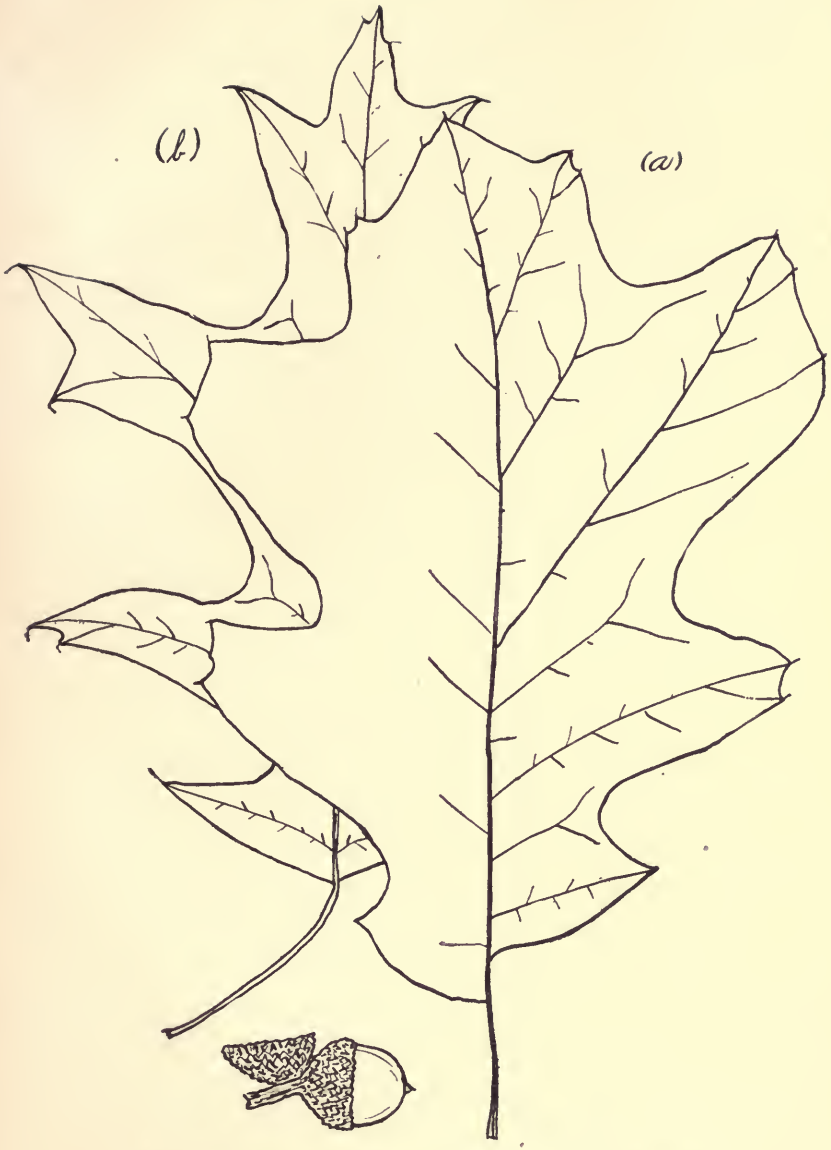

Fig. 62, *a* and *b*.—**Black Oak.** (Q. c., tinctòria, Gray.)
FRUIT AND LEAVES REDUCED ONE FOURTH.

It is very probable that the "Black Oak" and the "Scarlet Oak" ought to be considered as *one*, and described, not as species and variety, but as slightly different forms of the single species Q. coccinea. Though the most distinctive leaves of the "Black Oak" are easily recognized, often others are so nearly like those of the "Scarlet Oak" that it is not easy to distinguish between them; and the same is true of the fruit and the bark. Michaux f. says: "The only constant difference between the acorns of the Scarlet Oak and the Black Oak is in the kernel, which is white in the Scarlet Oak and yellow in the Black Oak."

The *Gray Oak* (Q. c., ambigua, Gray) is a variety sometimes found along the northeastern boundary of the States (as far as Lake Champlain) and northward. It combines the foliage of the Red Oak with the acorn of the Scarlet Oak.

Fig. 63.—Red Oak. *Q. rubra, L.*

Leaves, SIMPLE; ALTERNATE; EDGE LOBED (edges of the lobes mostly entire, but slightly toothed toward the ends).

Outline, about oval. *Base*, short wedge-shape, or rounded. Ends of the lobes and of their one to three slight teeth, pointed and bristle-tipped.

Leaf, six to nine inches long, three to five inches wide; both surfaces smooth. *Lobes*, nine to thirteen, usually very tapering from the base, with the hollows between them rounded and *narrow* and extending about half way to the middle rib.

Bark of trunk, dark, greenish-gray, and continuing smooth longer than on any other oak, never becoming as rough, for example, as that of the black oak.

Fig. 63.—Red Oak. (Q. rubra, L.)
NATURAL SIZE.

Acorns, large and stemless, or nearly so. *Cup*, flat saucer-shape, bulging, very shallow, nearly smooth, with small scales. *Nut*, about one inch long, somewhat egg-shape; bitter. October.

Found, from Nova Scotia and New Brunswick westward and southward. Very common, especially at the North, and extending farther north than any other Atlantic oak.

A tree fifty to eighty feet high, with wood that at the East is porous and not durable (though often of better quality westward). It is used for clapboards and in cooperage. The leaves change in the fall to dark red.

Fig. 64.—Pin Oak, Swamp Spanish Oak, Water Oak. *Q. palùstris, D. Roi.*.

Leaves, SIMPLE; ALTERNATE; EDGE LOBED (edges of the lobes mostly entire, but notched and toothed towards the ends).

Outline, narrow oval or broad oval. *Base*, from long wedge-shape to squared. Ends of lobes and of the teeth pointed and bristle-tipped.

Leaf, three to five inches long; both sides bright green, smooth, and shining; downy in the angles of the ribs below. *Lobes*, seven to nine, usually seven, with the hollows between them broad and round and usually reaching about three fourths of the way or more to the middle rib. The wide type of leaf closely resembles the leaves of the scarlet oak, but it is *smaller* and usually the hollows reach nearer to the middle rib.

Bark, smoothish (comparatively), inner bark reddish.

Acorns, numerous, small, on short stems. *Cup*, top-shaped, shallow, and nearly smooth. *Nut*, rounded, one half inch long or less, sometimes broader than long, light brown. October.

Fig. 64.—Pin Oak. (Q. palùstris, D. Roi.)
NATURAL SIZE.

Found, from the valley of the Connecticut to Central New York, southward to Delaware and the District of Columbia; in Southern Wisconsin and southward; usually along streams and on low, wet land. Most common and reaching its finest growth west of the Alleghany Mountains.

A handsome tree forty to sixty feet high, usually with a pointed top and with light and delicate foliage. The wood is rather coarse and not durable. It takes its name of Pin Oak from the peg-like look of the dead twigs and short branches with which the lower parts of the tree are usually set.

Fig. 65.—Willow Oak, Peach-leaved Oak. *Q. Phellos, L.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long and narrow. *Apex*, pointed and bristle-tipped. *Base*, pointed.

Leaf, three to four inches long (sometimes five); one half to seven eighths of an inch wide; rather thick and stiff; smooth and shining above; somewhat dull beneath; very young leaves, light green above and soft, whity-downy beneath.

Bark, thick and smoothish.

Acorns, small, nearly stemless. *Cup*, rather shallow, saucer-shaped, or somewhat rounded top-shape. *Nut*, about three eighths of an inch long, rounded, brown; kernel, bitter and bright orange. October.

Found, from Staten Island and New Jersey southward along the coast to Northeastern Florida and the Gulf States, and from Kentucky southwestward. Usually on the borders of swamps and in sandy woods.

A tree thirty to fifty feet high, with poor wood.

Fig. 65.—Willow Oak. (Q. Phellos, L.)
NATURAL SIZE.

Fig. 66.—Shingle Oak, Laurel Oak. *Q. imbricària, Michx.*

Leaves, SIMPLE; ALTERNATE; EDGE ENTIRE.

Outline, long and narrow. *Apex*, pointed and bristle-tipped. *Base*, pointed.

Leaf, three to six inches long; one to two inches wide; smooth and shining above; somewhat downy beneath; thick and stiff.

Bark, smooth and unbroken.

Acorns, small, nearly stemless. *Cup*, shallow. *Nuts*, rounded; about one half inch in diameter; bitter. October.

Found, in Lehigh County, Pennsylvania (Porter), westward to Southeastern Iowa, and southward. Most common west of the Alleghany Mountains.

A tree thirty to fifty feet high, with poor wood, that is used at the West for shingles and clapboards.

NOTE.—Of the nine hybrids that have been recognized, most are outside of our limits or entirely local. Mention need be made only of two:

Q. heterophylla, Michaux ("Bartram's Oak"). Staten Island and New Jersey to Delaware and North Carolina.

Q. Rudkìni, Britt. New Jersey.

THE OAK.

"Live thy Life,
Young and old,
Like yon oak,
Bright in spring,
Living gold;

Summer-rich
Then; and then
Autumn-changed,
Sober-hued
Gold again.

All his leaves
Fall'n at length,
Look, he stands,
Trunk and bough,
Naked strength."

ALFRED (LORD) TENNYSON, 1889.

NOTE.—See *Sassafras* (S. officinàle), under Section A, *I.*, page 18.
NOTE.—See *Buttonwood* (P. occidentàlis), under Section A, *II.*, page 53.

Fig. 66.—Shingle Oak. (Q. imbricària, Michx.)
NATURAL SIZE.

Genus LIQUIDÀMBER, L. (Sweet Gum.)

Fig. 67.—Sweet Gum, Bilsted. *L. styracìflua, L.*

Leaves, SIMPLE; ALTERNATE; EDGE DEEPLY LOBED (lobes finely and sharply toothed throughout).

Outline, rounded. The lobes are five to seven, radiating from the base. *Apex* of the lobes, pointed. *Base* of the leaf, heart-shape.

Leaf, three to seven inches in diameter, smooth and shining, with a pleasant odor when bruised. Ribs tufted at their angles.

Bark, gray; usually strongly winged with corky ridges along the branchlets. In the South, a spicy gum, from which the tree takes its name, oozes from the bark.

Fruit, small woody pods are collected into a round ball. These usually contain a few good seeds and a large number of others that resemble saw-dust. September.

Found, from Connecticut to Illinois, and southward. It reaches its finest growth and is very common in the bottom lands of the Mississippi basin.

A fine tree sixty to seventy feet high, or southward one hundred feet and more. The wood is valuable, and would be better appreciated except for the difficulty of seasoning it. It is sometimes used as a substitute for Black Walnut. Its gum is used medicinally.

NOTE 1.—See *Mulberry*, under A, *II.*, page 50.
NOTE 2.—See *Paper Mulberry*, under A, *II.*, page 52.
NOTE 3.—See *Silver Poplar*, with its genus, under A, *II.*, page 94.

Fig. 67.—Sweet Gum. (L. styraciflua, L.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

CONTINUED

LEAVES OPPOSITE

(EDGE ENTIRE)

B I

Genus CORNUS, L. (Dogwood.)

From a Greek word meaning horn, because of the hardness of the wood.

Fig. 68.—Flowering Dogwood, Cornel. *C. florida, L.*

Leaves, SIMPLE; OPPOSITE; EDGE ENTIRE.

Outline, egg-shape, or often broad oval, or reverse egg-shape. *Apex*, pointed, often taper-pointed. *Base*, pointed and usually slightly unequal.

Leaf-stem, short (about one half inch).

Leaf, three to five inches long; smooth above; pale and nearly smooth beneath; with the whitish ribs very distinct and curved.

Bark of trunk, blackish and rough, with short, broken ridges. The bark, especially of the roots, is very bitter and is used as a tonic.

Flowers. The real flowers are greenish-yellow, in a small, rounded bunch; but this bunch is surrounded by four large, petal-like leaves, white and often tinged with pink, more than an inch in length, reverse egg-shaped, and ending in a hard, abruptly turned point. The appearance is of a single large flower. The tree blossoms in May before the leaves are fully set.

Fruit. The "flower" is succeeded by a bunch of oval berries that turn bright red as they ripen, making the tree in the autumn, with its richly changing foliage, nearly as attractive as in the spring.

Fig. 68.—Flowering Dogwood. (C. flòrida, L.)
NATURAL SIZE.

Found, in rich woods, from New England to Minnesota, and southward to Florida and Texas. It is very common, especially at the South.

A finely shaped, rather flat-branching tree, usually twelve to thirty feet high, but dwindling, northward, to the dimensions of a shrub; one of the most ornamental of all our native flowering trees. Its character throughout and the extent of its range would seem to warrant the recognition of its blossom as the "national flower."

Fig. 69. — Alternate-leaved Dogwood, Alternate-leaved Cornel. *C. alternifòlia, L. f.*

Leaves, SIMPLE; ALTERNATE (often crowded at the ends of the branches); EDGE ENTIRE.

Outline, broadly oval or egg-shape or reverse egg-shape. *Base*, slightly pointed. *Apex*, pointed.

Leaf-stem, one inch long or more.

Leaf, about three to four inches long, sometimes yellowish-green; smooth above; whitish beneath, and slightly rough between the prominent curved ribs, seldom entirely flat, usually in clusters at the ends of the branches.

Bark of the branches, smooth, yellowish-green, with whitish streaks.

Flowers, yellowish in loose flat clusters. June.

Fruit, very dark blue when ripe, on reddish stems. August.

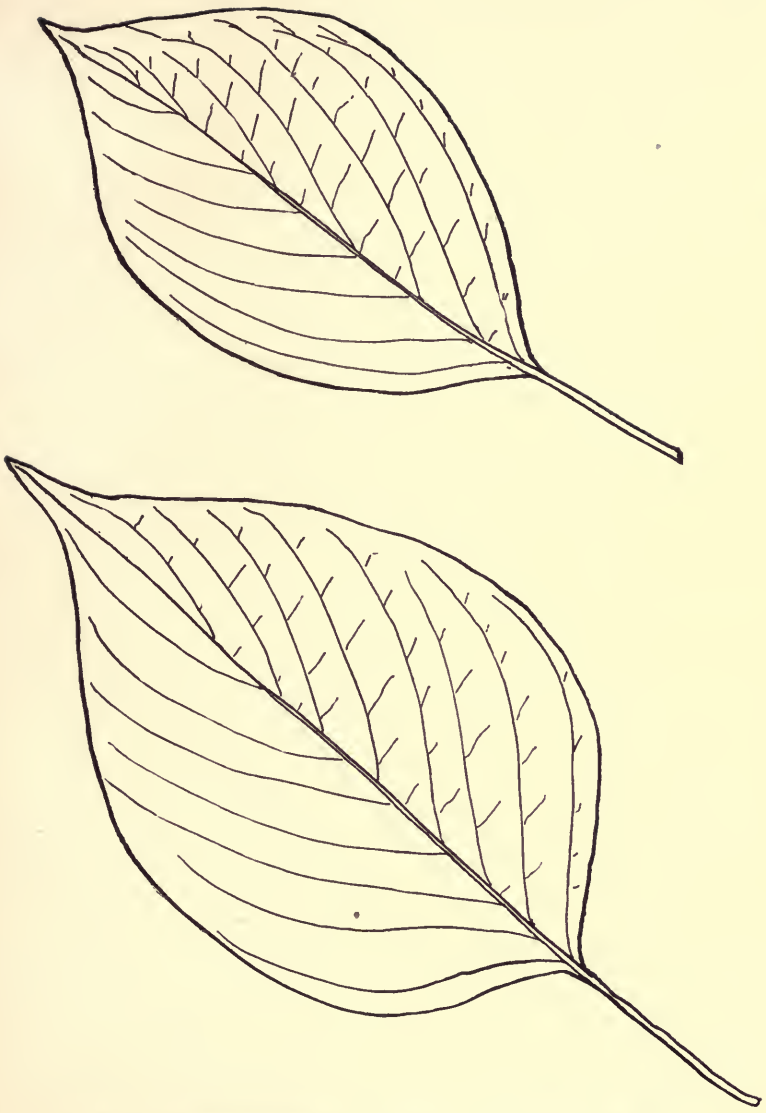

Fig. 69.—Alternate-leaved Dogwood. (C. alternifòlia, L. f.)
NATURAL SIZE.

Found, in low rich woods and along streams, from New Brunswick through the Northern States, and southward along the Alleghany Mountains to Northern Georgia and Alabama.

A small tree or shrub, ten to twenty feet high, with wide-spreading branches and flattish top. A "Shaker Medicine" is made from its bitter bark.

Genus CHIONÀNTHUS, L. (Fringe Tree.)

From two Greek words meaning "snow" and "flowers."

Fig. 70.—Fringe Tree. *C. Virgìnica, L.*

Leaves, SIMPLE; OPPOSITE; EDGE ENTIRE.

Outline, oval, long oval, or reverse egg-shape. *Apex*, pointed (or sometimes rounded). *Base*, pointed.

Leaf, smooth.

Flowers, with narrow petals nearly an inch in length, snow-white, in long, loose, and drooping clusters. June.

Fruit, one half to two thirds of an inch long, oval, purplish, with one stony seed.

Found, along the banks of streams from New Jersey and Southern Pennsylvania southward. Common and very ornamental in cultivation.

A small tree eight to twenty-five feet high, or often a shrub.

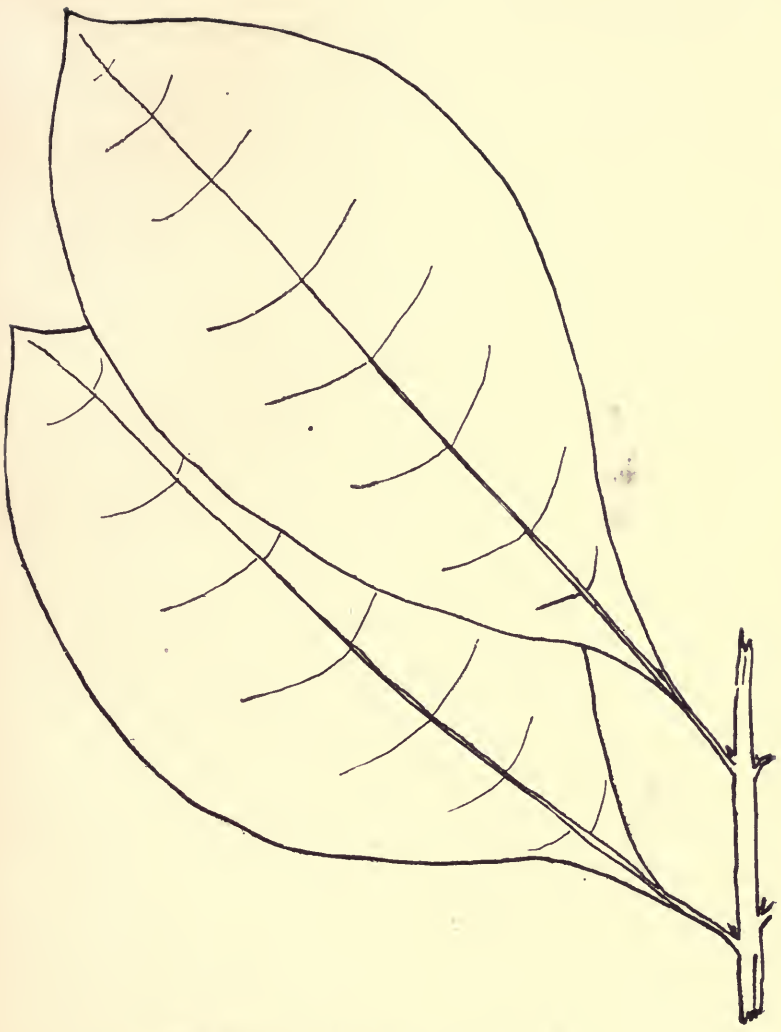

Fig. 70.—Fringe Tree. (C. Virginica, L.)
NATURAL SIZE.

Genus CATALPA, Scop., Walt. (Catalpa.)

Probably a corruption of the Indian word Catawba, which was the name of an important tribe that occupied a large part of Georgia and the Carolinas.

Fig. 71.—Catalpa, Catawba, Indian Bean. *C. bignonoides, Walt.*

Leaves, SIMPLE; OPPOSITE; EDGE ENTIRE.

Outline, broad egg-shape or heart-shape. *Apex*, pointed. *Base*, heart-shape.

Leaf, five to eight inches wide; smooth above, downy below, especially on the ribs.

Bark of trunk, a silver-gray, only slightly furrowed.

Flowers, very showy and fragrant, in large, upright pyramid-shaped clusters; white or violet-tinged, spotted inside with yellow and purple. July.

Fruit, in long, rounded pods (six to twelve inches long, about half an inch in diameter), with the seeds winged and fringed. They often remain throughout the winter. October.

Found, now very widely naturalized throughout the Middle and Southern Atlantic States, though formerly a rare and local Southern tree.

A low, very ornamental tree, usually twenty to thirty feet high. Its seeds and bark are considered medicinal.

Another species, *C. speciosa, Ward*, larger and of more value, is sometimes met with in Southern Illinois and the adjoining States.

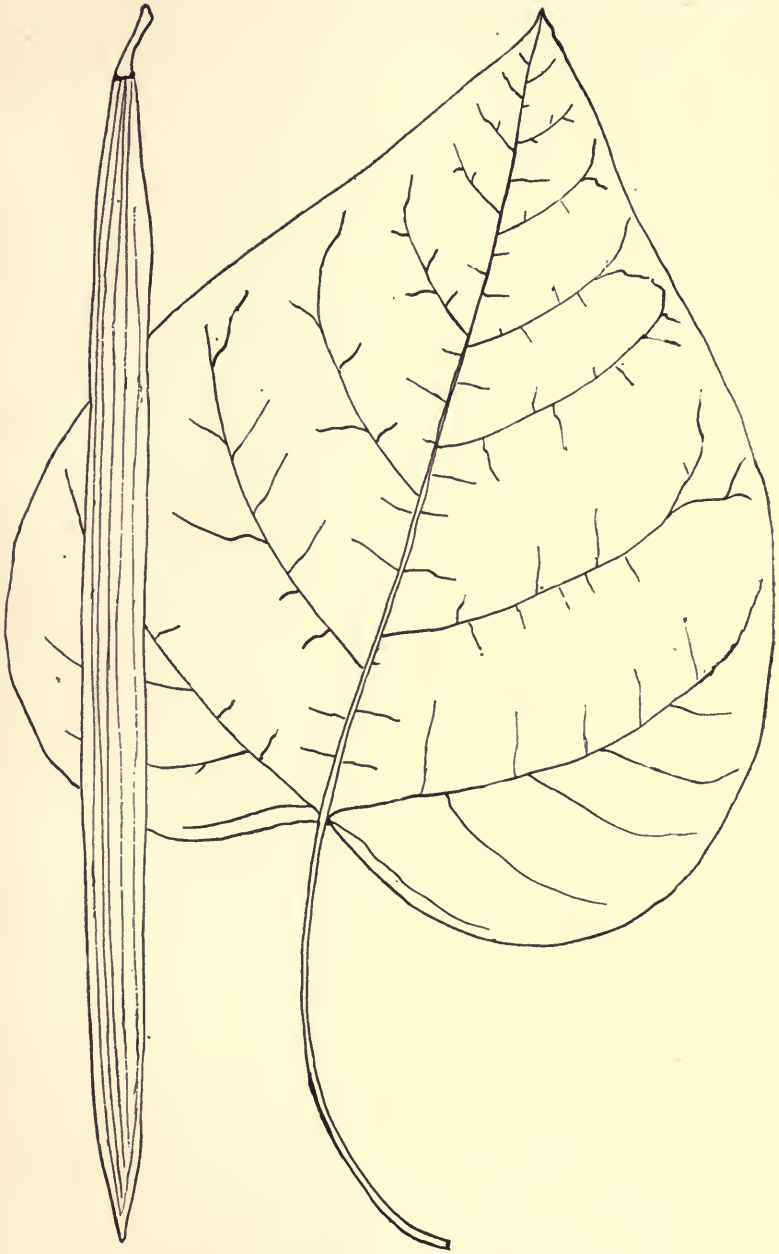

Fig. 71.—Catalpa. (C. bignonoides, Walt.)
LEAF AND FRUIT REDUCED ONE THIRD.

TREES WITH SIMPLE LEAVES

LEAVES OPPOSITE

CONTINUED

(EDGE TOOTHED)

B II

Genus VIBÙRNUM, L. (Haw and Viburnum.)

Fig. 72.—Black Haw, Stag Bush. *V. prunifòlium, L.*

Leaves, SIMPLE; OPPOSITE; FINELY AND SHARPLY TOOTHED.

Outline, broadly oval, or broadly reverse egg-shape. *Apex*, rounded, sometimes pointed. *Base*, rounded, sometimes slightly pointed. Quite variable.

Leaf-stem, short and smooth, the edges slightly winged, the *wings straight*.

Leaf, about one and a half to two inches long; smooth; shining above.

Flowers, white, in rather large and flat, stemless bunches at the ends of the branches. May.

Berries, oval, blackish, sweet and edible.

Found, in Connecticut and Southern New York to Michigan and southward.

A small tree fifteen to twenty feet high, or oftenest at the North a low, much-branching shrub. Usually with some of its branches stunted and bare.

The tonic bark is sometimes used medicinally.

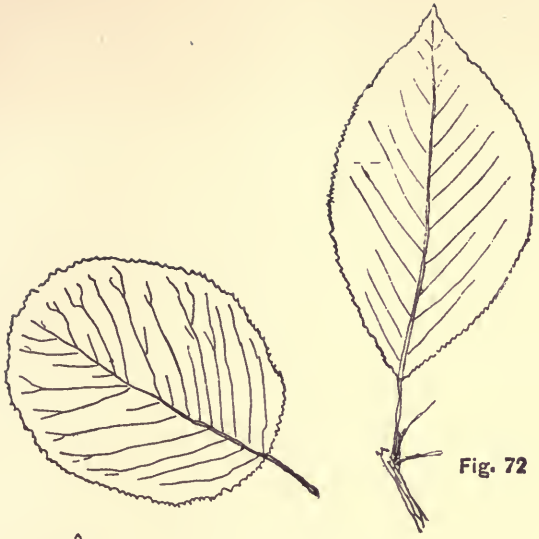

Fig. 72

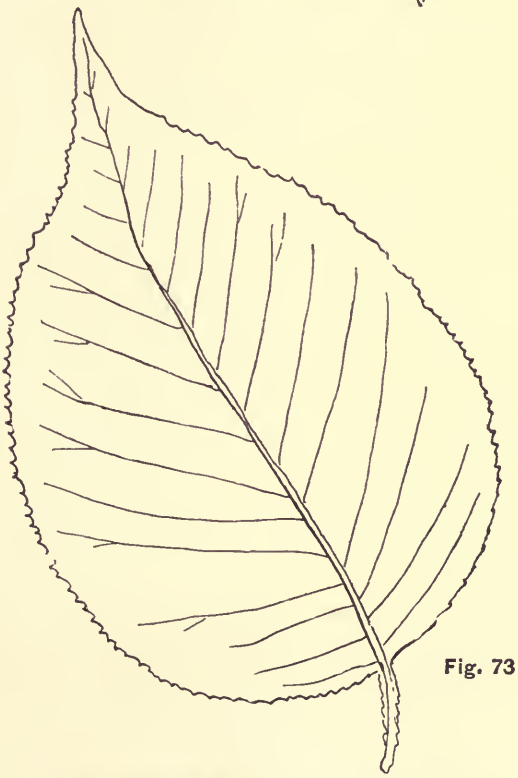

Fig. 73

Fig. 72.—Black Haw. (V. prunifòlium, L.)
Fig. 73.—Sweet Vibùrnum. (V. lentàgo, L.)
NATURAL SIZE.

Fig. 73.—Sweet Vibùrnum, Sheep Berry, Nanny Berry.
V. lentàgo, L.

Leaves, SIMPLE; OPPOSITE; EDGE CLOSELY AND SHARPLY TOOTHED.

Outline, egg-shape. *Apex*, pointed. *Base*, round. Quite variable.

Leaf-stem, *winged* on both sides with a *wavy border;* when young, sprinkled with brownish glands.

Leaf, about three to four inches long, and half as wide or more; smooth.

Flowers, white, in flat, stemless clusters. May, June.

Fruit, one half-inch long; oval; sweetish; red, becoming almost black when ripe; edible.

Found, from Hudson's Bay through the Northern States, southward to Georgia. Common in swamps and rich, moist soil.

A tree fifteen to twenty feet high, with hard, ill-smelling wood.

TREES WITH SIMPLE LEAVES

LEAVES OPPOSITE

CONTINUED

(EDGE LOBED)

B III

Genus ACER, L. (Maple.)

From a Latin word meaning sharp, because of the ancient use of the wood for spear-heads and other weapons.

Fig. 74.—Striped Maple, Moosewood, Whistlewood, Goose-foot Maple. *A. Pennsylvànicum, L.*

Leaves, SIMPLE; OPPOSITE; EDGE LOBED, with the lobes very finely and sharply toothed.

Outline, rounded in the lower half, three-lobed above with the hollows between the lobes sharp. *Apex* of the lobes, slim and pointed. *Base*, more or less heart-shape.

Bark, smooth, green, and peculiarly marked lengthwise with dark stripes.

Flowers, large, yellowish-green. May, June.

Fruit, with spreading pale-green wings, in long clusters.

Found, in Canada, through the Northern Atlantic States, westward to Northeastern Minnesota, and along the Alleghany Mountains to Georgia.

A small and slender tree or shrub, usually ten to twenty-five feet high.

Fig. 74.—Striped Maple. (A. Pennsylvànicum, L.)
NATURAL SIZE.

Fig. 75.—Sugar Maple, Hard Maple, Rock Maple. *A. sàccharum, Marsh. A. saccharìnum, Wang.*

Leaves, SIMPLE; OPPOSITE; EDGE LOBED, with the lobes very sparingly and coarsely sharp-toothed or the lower pair entire.

Outline, rounded, with three to five lobes, usually five, with the hollows between the lobes and between the coarse teeth *rounded*. *Apex* of the lobes, pointed. *Base*, heart-shaped or nearly squared.

Leaf, dark green above; slightly lighter beneath; smooth or somewhat downy on the ribs; closely resembling that of the introduced "Norway Maple" but lacking the latter's milky-juiced leaf-stem.

Bark, light gray, usually smoothish when young, becoming rough and scaly.

Flowers, yellowish-green and very abundant. April, May.

Fruit, greenish-yellow, smooth, drooping, on thread-like and hairy stems one to two inches long, with wings about one inch long, broad and slightly spreading. September.

Found, from Southern Canada through the Northern States, southward along the Alleghany Mountains, and westward to Minnesota, Eastern Nebraska, and Eastern Texas. Its finest development is in the region of the Great Lakes. It grows in rich woods; often it forms "groves," sometimes extensive forests.

A tree fifty to eighty feet high or more; of very great value in many directions,—as a shade-tree, for fuel, for

Fig. 75.—Sugar Maple. (A. sàccharum, Marsh.)
NATURAL SIZE.

interior finish and the making of furniture, for its ashes, which give large quantities of potash; especially for its sap, which yields the "maple sugar" of commerce.

Accidental variations furnish the handsome *Bird's-eye Maple* and *Curled Maple.*

The yield of sugar by an average tree in one season is from five to ten pounds.

Fig. 76.—Black Maple. *A. s., var. nigrum, T. and G.*

This variety is distinguished from its species (*i. e.*, from the Sugar Maple) by the shape of its leaf, which, however, is somewhat variable, and also by the following items:

Bark, blackish.

Base of the leaf, when heart-shaped, sometimes with overlapping lobes.

Seed-wings, set wide apart, but only slightly diverging.

Found, chiefly along streams and in river bottoms, from Western Vermont to Missouri and Northern Alabama.

Fig. 77.—Silver Maple, White Maple, Soft Maple. *A. saccharìnum, L. A. dasycàrpum, Ehr.*

Leaves, SIMPLE; OPPOSITE; EDGE DEEPLY LOBED, with the lobes unequally notched and toothed.

Outline, rounded, with five lobes (the lowest pair much the smallest), and with the hollows between the lobes *pointed* and usually extending half way to the base of

Fig. 76.—Black Maple. (A. s., var. nigrum.)
NATURAL SIZE.

the leaf. *Apex* of lobes, pointed. *Base*, heart-shaped or nearly squared.

Leaf, silvery white beneath; downy when young, becoming smooth.

Flowers, small, pale, yellowish-green; in crowded clusters. March, April.

Fruit, yellowish-green; woolly when young, becoming nearly smooth; on stems about one inch long, with very large, wide-spreading wings (two to three inches long), one of which is *often undeveloped*. July, August.

Found, widely distributed, but most common west of the Alleghany Mountains and southward.

A tree thirty to fifty feet high, with soft, white wood of comparatively slight value.

Fig. 78.—Red Maple, Swamp Maple, Soft Maple. *A. rubrum, L.*

Leaves, SIMPLE; OPPOSITE; EDGE LOBED, with the lobes irregularly sharp-toothed and notched.

Outline, roundish, with three to five lobes (the lowest pair, if present, the smallest); and with the hollows between the lobes pointed and usually extending *less than half-way* to the base of the leaf. *Apex* of the lobes, pointed. *Base*, heart-shaped (or sometimes rounded.

Leaf-stem, long and round.

Leaf (very variable in size and in the toothing and shape of its lobes); usually about two to four inches wide, with short lobes; whitish beneath.

Fig. 77.—Silver-Leaf Maple. (A. saccharìnum, L.)
NATURAL SIZE.

Bark, smoothish; gray, becoming dark and rough with age.

Flowers, rich crimson, on short stems in drooping clusters. March, April.

Fruit, bright red, smooth, with stems two to three inches long. The wings are about one inch long. At first they approach each other, but afterward are somewhat spreading. September.

Found, widely distributed in swamps and along streams, especially in all wet forests eastward from the Mississippi to the Atlantic, and from Southern Canada to Florida and Texas.

A tree thirty to sixty feet high, with wood of considerable value, especially when it shows a "curly grain." It is one of the very earliest trees to blossom in the spring, and to show its autumn coloring in the fall.

Besides the above native Maples, modified and introduced forms are often met with in cultivation. Among them are the *Silver-striped Maple*, the *Cut-leaved Maple* (with the lobes extending nearly from the base of the leaf); the *Norway Maple* [A. platanòides, L.] (with a leaf resembling those of the Sugar Maple, but distinguished from them by the milky juice of its leaf-stem, and with large and very broadly flaring seed-wings); the *False Sycamore* [A. pseudo-plàtanus] (with its leaf resembling that of the Norway Maple in general shape, but having its lobes much more closely and more finely toothed, and with its large winged seeds short stemmed and arranged in long, drooping clusters); and, less frequently, the *Japanese Maple*.

Fig. 78.—Red Maple. (A. rubrum, L.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

CONTINUED

LEAVES INDETERMINATE

C I

GUIDE FOR THE CONE-BEARING TREES.

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CONE-BEARING TREES.

Genus PINUS, L. (Pine.)

From a Celtic word meaning rock or mountain.

Fig. 79.—Gray Pine, Northern Scrub Pine, Prince's Pine.
P. Banksiàna, Lam.

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *two-leaved*, sheathed bunches.

Leaf, needle-shape, about one inch long, pointed, stiff, curved, rounded on the back, grooved above.

Cones, nearly two inches long, gray, usually in pairs, and curved like small horns, with a peculiar habit of always pointing in the same direction as the branches. *Scales*, blunt, smooth, not armed with points or knobs.

Found, along the northern frontier of the United States and far northward. Its best growth is north of Lake Superior.

A small evergreen tree, or often a shrub, five to thirty feet high, with long, spreading branches, and light, soft wood that is of but slight value.

Fig. 80.—Jersey Pine, Scrub Pine. *P. Virginiàna, Mill. P. inops, Ait.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *two-leaved* sheathed bunches.

Leaf, needle-shape, one and three fourths to two and three fourths inches long, stiff, bluntish; on the outer side smooth and rounded; on the inner side flat, and rough downwards.

Cones, one and three fourths to three inches long, usually single and pointing downward. *Scales*, tipped with a stiff, straight prickle.

Bark of the trunk, rough and blackish. Young branches *smooth* (in other pines scaly). *Twigs*, purplish.

Found, from Long Island along the coast to South Carolina, and through Eastern and Middle Kentucky to Southeastern Indiana; in sandy and generally barren soil.

An evergreen tree fifteen to forty feet high, irregular in shape and with straggling, spreading, or drooping branches. The timber is very "pitchy," soft, and durable, but poor even for fuel.

"Next to the Gray Pine, the Jersey Pine is the most uninteresting species of the United States."—MICHAUX, f.

Fig. 81.—Table Mountain Pine, Hickory Pine. *P. pungens, Michx.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *two-leaved* sheathed bunches.

Fig. 79

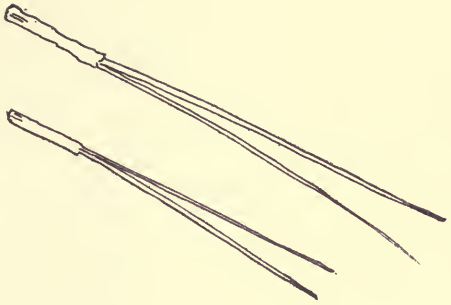

Fig. 80

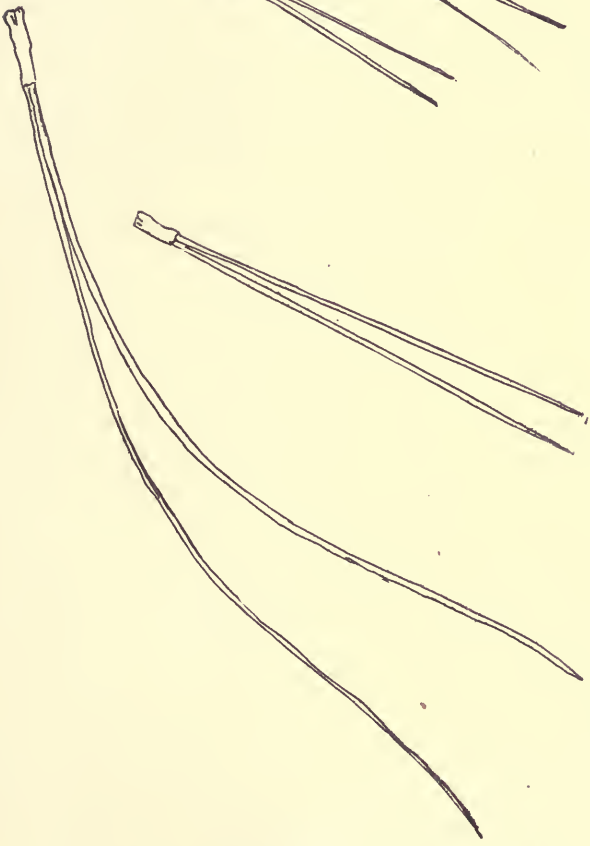

Fig. 81

Fig. 82

Fig. 79.—Gray Pine. (P. Banksiàna, Lam.)
Fig. 80.—Scrub Pine. (P. Virginiàna, Mill.)
Fig. 81.—Table Mountain Pine. (P. pungens, Michx.)
Fig. 82.—Red Pine. (P. resinòsa, Ait.)

NATURAL SIZE.

Leaf, needle-shape, about two and one half inches long; stiff; outer side smooth and rounded; inner side hollowed.

Cones, about three and one half inches long, of a light yellow color, stemless, often united in clusters of fours. *Scales*, with a stout spine, widening at its base, one sixth of an inch in length.

Found, within narrower limits than any other American Pine; along the Alleghany Mountains from Pennsylvania to Tennessee, especially upon Table Mountain in North Carolina, one of the highest peaks of the range.

A tree ten to fifty feet high, with light and soft wood, largely used for charcoal.

Fig. 82.—Red Pine, Norway Pine. *P. resinòsa, Ait. P. rubra, Michx, f.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *two-leaved* sheathed bunches.

Leaf, needle-shape, five to eight inches long; dark, dull, green; rounded and smooth on the outside; on the inside hollowed.

Cones, about two to three inches long; rounded at the base; sometimes crowded in large clusters. *Scales*, not armed with points or knobs.

Bark of the trunk, comparatively smooth and reddish, of a clearer red than that of any other species in the United States.

Found, in dry and sandy soil from Newfoundland and the northern shores of the Gulf of St. Lawrence to the Winnipeg River, through the Northern States to Massachusetts, in the mountains of Northern Pennsylvania. Rare in the Eastern States, except in the extreme northern parts of New England.

An evergreen tree fifty to eighty feet high, or more, with hard and durable wood, useful for all kinds of construction. It is low-branching and regular in shape.

In a note given in confirmation of his estimate of the height of the red pine, Michaux says that when the French in Quebec built the war-ship *St. Lawrence*, fifty guns, they made its main-mast of this pine.

Fig. 83.—Yellow Pine, Short-leaved Pine, Spruce Pine. *P. ecpinàta, Mill. P. mitis, Michx.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *two-leaved* sheathed bunches. (On vigorous young shoots the leaves are sometimes clustered in threes, not on the old branches.)

Leaf, needle-shape, two and a half to five inches long, usually four to five inches; dark green; slender; rounded on the outer side; on the inner side, hollowed.

Cone, about two to three inches long, in old trees scarcely more than one and a half inches long; the smallest of the American Pine cones; surface roughened by the slightly projecting ends of the scales; not growing in large clusters. *Scales*, tipped with a weak prickle pointing outward.

Found, in Staten Island and New Jersey, and southward to Western Florida; through the Gulf States, Arkansas, and parts of Kansas, Missouri, and Illinois.

An evergreen tree forty to eighty feet high, with *straight trunk*, *regular branches*, and *pyramid-shaped* head. The timber is hard and very valuable, second in value (among the Yellow Pines) only to the "Georgia Pine" (P. palustris—"Long-leaved Pine," "Southern Pine").

Fig. 84.—Pitch Pine. *P. rigida, Mill.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *three-leaved* sheathed bunches.

Leaf, needle-shaped, three to six inches long; stiff and sharp; the outer side flattish; the inner side slightly ridged, and rough downwards.

Bark, very thick and rough, and deeply fissured; dark, often with a reddish or purplish tinge.

Cones, two to three inches long, oftenest in clusters of two to four. *Scales*, tipped with stiff and sometimes curved prickles.

Found, from New Brunswick to Lake Ontario, through the Atlantic States to Northern Georgia, and extending to the western slope of the Alleghany Mountains, in West Virginia and Kentucky. Usually in dry, sandy soil, sometimes in deep swamps. Very common.

An evergreen tree thirty to eighty feet high, with very irregular branches, and a trunk that is seldom straight to the top. The wood is hard and full of pitch, of slight value except for fuel and charcoal and coarse lumber.

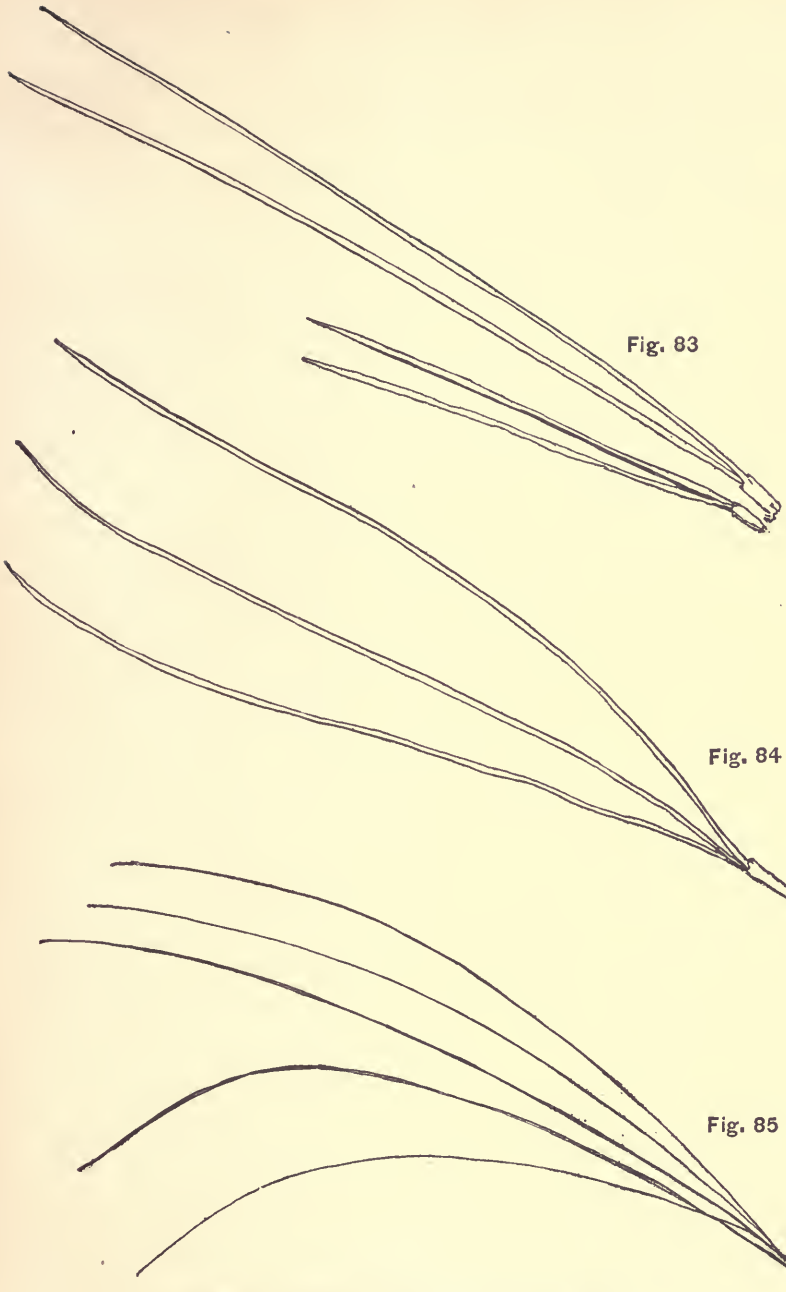

Fig. 83.—Yellow Pine. (P. ecpinàta, Mill.)
Fig. 84.—Pitch Pine. (P. rìgida, Mill.)
Fig. 85.—White Pine. (P. Strobus, L)

NATURAL SIZE.

Fig. 85.—White Pine, Weymouth Pine. *P. Strobus, L.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness, but arranged along the branches in *five-leaved* bunches, with their *sheaths lacking* or very short, excepting when young.

Leaf, needle-shape, three to five inches long, light bluish-green, three-sided, soft, and very slender.

Cones, four to six inches long, cylinder-shape, about one inch in diameter before the scales loosen; solitary, drooping, slightly curved. *Scales*, thin, without prickles.

Bark of trunk, *lighter* than in the other pines; in young trees *smooth*, and only slightly rough when older.

Found, from Newfoundland to the Winnipeg River, southward through the Northern States, and along the Alleghany Mountains to Georgia. Its finest growth is in the region of the Great Lakes.

An evergreen tree of soft and delicate foliage, eighty to one hundred and fifty feet high; one of the most valuable timber trees of any country. The wood is clear of knots, straight-grained, and soft, and is used in immense quantities for building and in many kinds of manufacturing. The branches are given off in flat, regular whorls around the straight trunk.

Genus PÌCEA, Link. (Spruce.)

Fig. 86.—Black Spruce. *P. Marìàna (Mill) B. S. P. P. nigra, Link.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness; arranged singly and thickly all around the branchlets.

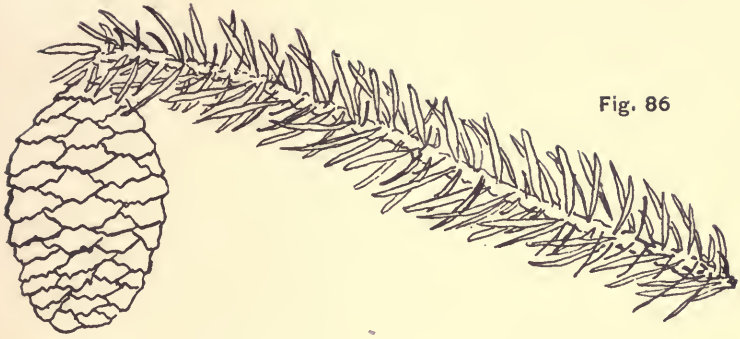

Fig. 86

Fig. 87

Fig. 86.—Black Spruce. P. Mariàna (Mill), B. S. P.
Fig. 87.—White Spruce. P. Canadènsis (Mill), B. S. P.
NATURAL SIZE.

Leaf, needle-shape, five twelfths to two thirds of an inch long, four-sided, mostly straight, stiff, and sharp; dark green.

Cones, three fourths to one and one half inches long, drooping at the ends of the branchlets; broad oval; *dark purple* when young, becoming *reddish-brown* as they ripen. *Scales*, long reverse egg-shape, thin, with a *wavy or toothed edge* toward their apex.

Found, along the Alleghany Mountains from the high peaks of North Carolina to Pennsylvania, through the Northern States, and far northward. In the North it often forms large, dark forests.

An evergreen tree thirty to sixty feet high, with straight, tapering trunk. The wood is light and straight-grained and is used for lumber, for the masts and spars of ships, in building, etc. From its twigs is prepared the "essence of spruce."

Fig. 87. — **White Spruce.** *P. Canadènsis (Mill.), B. S. P. P. alba, Link.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness; arranged singly all around the branchlets.

Leaf, needle-shaped, five twelfths to three fourths of an inch long, four-sided, curved, sharp, rather slender, bluish-green, much lighter than the leaf of the Black Spruce.

Bark, lighter than that of the Black Spruce.

Cones, one to two inches long, and always in the proportion of about two inches in length to one half

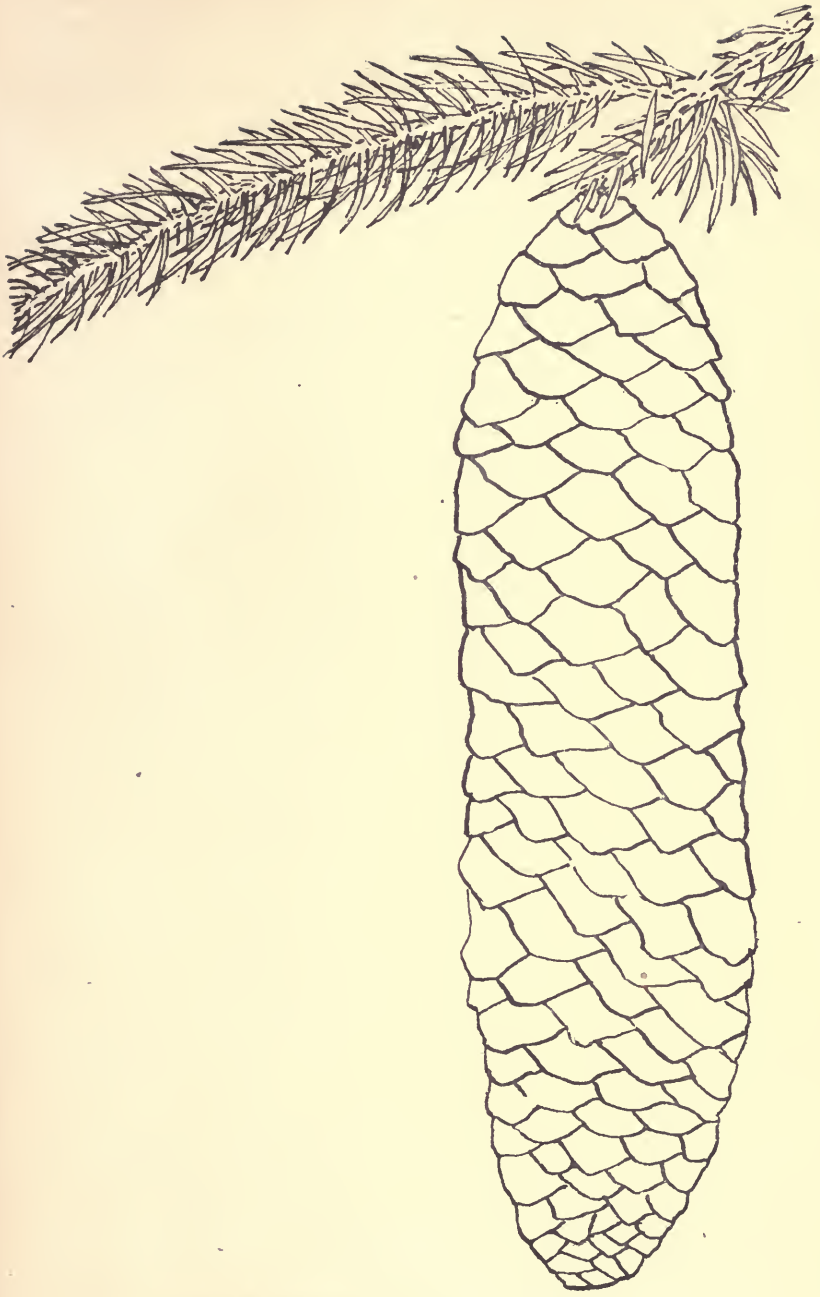

Fig. 88.—Norway Spruce. [P. excèlsa.]
NATURAL SIZE.

or three fourths of an inch in thickness; drooping at the ends of the branchlets; *long oval* or cylinder-shape; *pale green* when young, becoming *brownish* as they ripen. *Scales*, broad reverse egg-shape, with an *entire edge*, and rounded or somewhat two-lobed at the apex.

Found, in Maine, Northeastern Vermont, Northern Michigan, Minnesota, and far northward, on low ground and in swamps. It is most common north of the United States boundaries.

An evergreen tree, forty to seventy feet high. One of the most important of the Northern timber trees.

Fig. 88.—Norway Spruce. [*P. excèlsa.*]

This spruce is not a native, but is now very widely cultivated, and is sometimes found escaped from cultivation. It is a finer and larger tree than the native spruces, and differs from them especially in these items:

Cones, five inches and *more* in length; about one and a half inches in thickness.

Branches and branchlets, heavily drooping, especially in the older trees.

Genus TSUGA, Carr. (Hemlock.)

Fig. 89.—Hemlock. *T. Canadènsis (L.), Carr. Abies Canadènsis, Michx.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness; arranged singly in *two flat distinctly opposite ranks* up and down the branchlets.

Leaf, one half inch long, narrow; blunt; sometimes minutely toothed toward the apex; flat; green above; silvery white beneath.

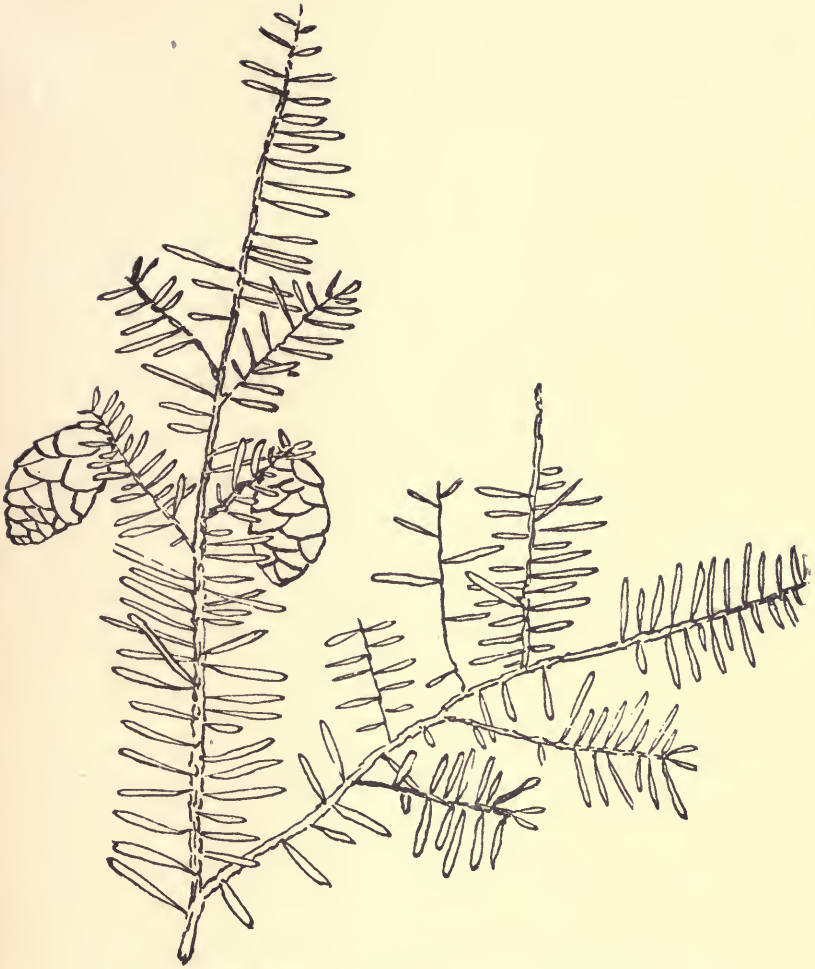

Fig. 89.—Hemlock. T. Canadènsis (L.), Carr.
NATURAL SIZE.

Bark, reddish and scaly; when old, somewhat roughened by long, shallow furrows.

Cones, very *small* (three fourths of an inch long); *drooping;* oval or egg-shape. *Scales*, few, thin, rounded, and entire. The seed with the wing is about three fourths the length of the scale. The cone *does not fall apart when ripe.*

Found, from Southern New Brunswick and the Valley of the St. Lawrence through the Northern States to Delaware, and along the Alleghany Mountains to Alabama. Common northward, often forming large forests.

An evergreen tree, sixty to eighty feet high, irregular in outline, very graceful, especially when young, with light and delicate foliage and horizontal or drooping branches. The timber is very coarse; the bark much used for tanning, and with medicinal qualities.

Genus ÀBIES, Link. (Fir.)

Fig. 90.—Balsam Fir, Balm of Gilead Fir. *A. balsàmea (L.), Miller.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness; arranged singly up and down the branchlets, at first radiating about equally on every side, afterward flattened into two ranks, as in the Hemlock.

Leaf, one half to one inch long, narrow; apex blunt or notched; edge entire; flat, with a grooved line above and a corresponding raised line below; bright green above; silvery white below.

Bark, smooth and unbroken (especially when young), and usually *covered with "blisters."*

Cones, two to four inches long, one inch broad, *erect*, at the sides of the branchlets; violet-colored. *Scales*, thin and flat, broad and rounded. The thin bracts between the scales are tipped with a slender bristle. *The cone falls apart when ripe.*

Found, from the far North through the Northern States to Pennsylvania, and along the Alleghany Mountains to the high peaks of West Virginia. Common northward in damp forests.

A slender, evergreen tree, twenty to sixty feet high; pyramid-shaped, with regular horizontal branches; its wood is very light and soft. From the "blisters," which form under the bark of the trunk and branches, the valuable Canada balsam is obtained.

The tree is short-lived, and therefore of less value in cultivation.

Genus LARIX, Tourn. (Larch.)

Fig. 91.—Larch, Tamarack, Hackmatack. *L. laricina (Du Roi), Koch. L. Americana, Michx.*

Leaves, SIMPLE; INDETERMINATE in position because of their closeness; arranged along the branches in many-leaved bunches without sheaths.

Leaf, thread-like, one to two inches long, withering and falling in the autumn.

Bark, smooth.

Cones, about one half inch long; broad egg-shaped; green or violet when young, becoming purple and brownish as they ripen. *Scales*, thin, nearly round, their edges entire.

Found, from Pennsylvania, Northern Indiana, and Northern Illinois through the Northern States and far northward. It grows usually in low, swampy land, where it often thickly covers large areas.

A tree fifty to one hundred feet high (not evergreen), with a straight trunk and slender, horizontal branches. The wood is durable, hard, and very strong, and is largely used in ship-building, for posts, railroad ties, etc.

The Indians and Canadians were accustomed to use the fibres of the Larch roots for sewing their bark canoes; and for tightening the seams, the gum of the Balsam Fir.

"Give me of your roots, O Tamarak!
Of your fibrous roots, O Larch-Tree!
My canoe to bind together,
So to bind the ends together,
That the water may not enter,
That the river may not wet me!

* * * * * *

"Give me of your balm, O Fir-Tree!
Of your balsam and your resin,
So to close the seams together
That the water may not enter,
That the river may not wet me!

"And the Fir-Tree tall and sombre,
Sobbed through all its robes of darkness,
Answered wailing, answered weeping,
'Take my balm, O Hiawatha!'"

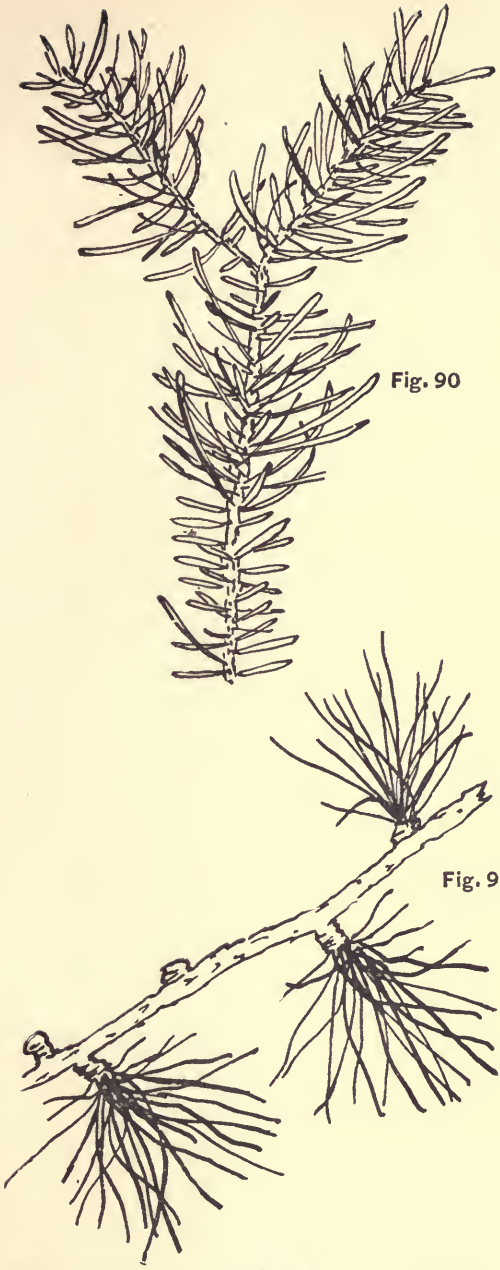

Fig. 90.—Balsam Fir. A. balsàmea (L.), Miller.
Fig. 91.—Larch. L, laricìna (Du Roi), Koch.
NATURAL SIZE.

Genus CHAMÆCYPARIS, Spach. (White Cedar.)

Fig. 92.—White Cedar. *C. thyoïdes (L.), B.S.P. C. sphæroïdea, Spach.*

Leaves, SIMPLE; INDETERMINATE in position because of their smallness and closeness. They are scale-like, somewhat egg-shape, overlapping each other, and closely pressed in four rows up and down the very flat branchlets. Each leaf has at its centre a raised gland, easily distinguished if held between the eye and the light.

Bark, fibrous. The "spray" (formed from the flat branchlets) is itself flat and very delicate and of a *dull green*.

Cones, about one fourth of an inch in diameter, *round*, variously placed, compact, *purplish* as they ripen; opening when ripe *toward the centre line* (*i. e.*, not toward its base). *Scales*, fleshy, *shield-shaped and apparently fastened near their centres*, with the edge *several-pointed*, and with a *sharp point or knob in the centre*. *Seeds*, usually four to eight under each scale, oval, with wide wings at the sides.

Found, in deep, cold swamps (filling them densely and exclusively), from Southern Maine along the coast to Florida, and along the Gulf coast to Mississippi.

A tapering evergreen tree, thirty to seventy feet high, with light and durable wood, largely used in boat-building, for wooden-ware, shingles, etc.

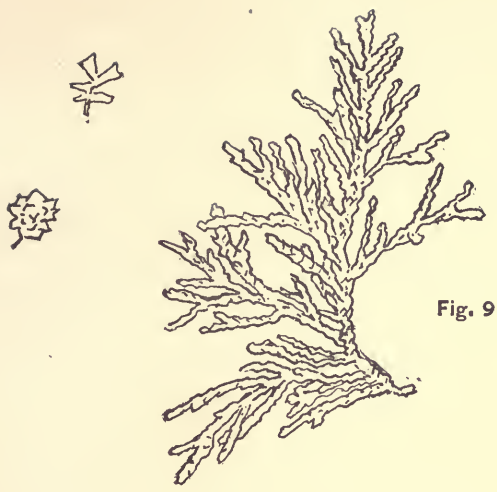

Fig. 92

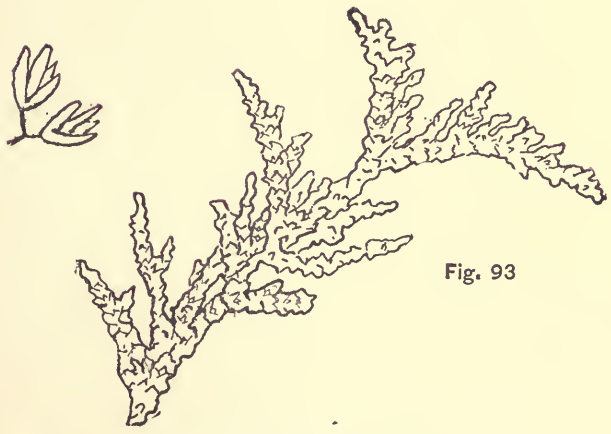

Fig. 93

Fig. 92.—White Cedar. C. thyoides (L.), B. S. P.
Fig. 93.—Arbor Vitæ. (T. occidentàlis, L.)
NATURAL SIZE.

Genus THÙYA, L. (Arbor Vitæ.)

From a Greek word meaning to sacrifice, because of the use of the fragrant wood in sacrifice.

Fig. 93.—Arbor Vitæ, White Cedar. *T. occidentàlis, L.*

Leaves, SIMPLE; INDETERMINATE in position because of their smallness and closeness. They are scale-like, somewhat egg-shape, overlapping each other, and closely pressed in four rows up and down the very flat branchlets. Each leaf has at its centre a raised gland, easily distinguished if held between the eye and the light.

Bark, fibrous. The "spray" (formed from the flat branchlets) is itself flat and of rather a *bright green.*

Cones, about five twelfths of an inch in length, *long oval* or *reverse egg-shape*, *nodding*, *yellowish-brown* as they ripen, *dry and opening to the base* when ripe. *Scales*, pointless, *oval or egg-shape*, *smooth* (*i. e.*, not pointed on the edge or near the centre.) *Seeds*, one to two under each scale, long and narrow (like a small caraway seed); broadly winged all around, with the wing notched at one end.

Found, along the Alleghany Mountains from the high peaks of North Carolina to Northern Pennsylvania and Central New York, northward into Southern Canada and westward; along rocky banks of streams and in swamps; very common at the North, where it often occupies large areas of swamp land. It is very widely cultivated, especially in hedges.

A tapering evergreen tree, twenty to fifty feet high, with close, dense branches, and a light and durable wood.

Genus JUNÌPERUS, L. (Red Cedar.)

From a Celtic word meaning rough.

Fig. 94.—Red Cedar, Savin. *J. Virginiàna, L.*

Leaves, SIMPLE; INDETERMINATE in position because of their smallness and closeness. They are arranged in four rows up and down the branchlets.

In young or rapidly growing sprouts the leaves are awl-shaped or needle-shaped, somewhat spreading from the branch, very sharp and stiff, placed in pairs (or sometimes in threes), usually about one fourth of an inch long, and with the fine branchlets, which they cover, *rounded.*

In the older and slower-growing trees the leaves are scale-like and overlapping, egg-shape, closely pressed to the branchlets which they cover, and with the branchlets *square.* As the branchlets grow, the lower scales sometimes lengthen and become dry and chaffy and slightly spreading.

Bark, brown and sometimes purplish-tinged, often shredding off with age and leaving the trunk smooth and polished.

"*Berries,*" about the size of a small pea, closely placed along the branchlets, bluish, and covered with a whitish powder.

Found, in Southern Canada, and distributed nearly throughout the United States—more widely than any other of the cone-bearing trees.

An evergreen tree, fifteen to thirty feet high (much larger at the South), usually pyramid-shaped, with a rounded base, but varying very greatly, especially near the coast, where it is often twisted and flattened into angular and weird forms. The wood is very valuable, light, straight-grained, durable, fragrant. It is largely used for posts, for cabinet-work, for interior finish, and almost exclusively in the making of lead pencils. The heart-wood is usually a dull red (whence the name), the sap-wood white.

Among the most picturesque objects in a Turkish landscape, standing like sentinels, singly or in groups, and as slender and upright as a Lombardy Poplar, are the black cypress trees (C. sempervirens). They mark the sites of graves, often of those which have long since disappeared. In America, more than any other northern tree, the red cedar gives the same sombre effect, whether growing wild or planted in cemeteries.

The *Common Juniper* (J. commùnis, L.), common as a shrub, is occasionally found in tree form, low, with spreading or drooping branches, and with leaves resembling those of a young Red Cedar, awl-shaped and spreading, but arranged in *threes* instead of *opposite*.

Fig. 94.—Red Cedar. (J. Virginiàna, L.)

a. Young. *b*. Old.

NATURAL SIZE.

TREES WITH COMPOUND LEAVES

(FEATHER-SHAPED)

LEAVES ALTERNATE

(EDGE ENTIRE)

D 1

Genus AILÀNTHUS,* Desf.

From a Greek word meaning "tree of heaven."

Fig. 95.—Ailànthus. [*A. glandulòsa, Desf.*]

Leaves, COMPOUND (odd-feathered, but with the odd leaflet often dwarfed or broken off; leaflets, twenty-one to forty-one); ALTERNATE; EDGE OF THE LEAFLETS ENTIRE, with *one or two coarse, blunt teeth* at each side of their base.

Outline, of leaflet, long egg-shape or lance-shape. *Apex*, taper-pointed. *Base*, squared, or heart-shaped.

Leaf-stem, smooth, round, swollen at base. *Leaflet-stems*, smooth and short.

Leaf, one and a half to six feet long. Leaflets variable, usually about six inches by two and a quarter, rather smooth and thin.

Bark of the trunk, smooth and brown; the new shoots marked with whitish dots.

Flowers, in long bunches at the ends of the branches; greenish, and of very disagreeable odor. June, July.

Seeds, flat, at the centre of greenish and sometimes pink-tinged wings, in large, loose clusters. October.

Found, common in cultivation, and to some extent naturalized.

* This spelling of the name should rule because so given by its author, although, etymologically, Ailantus would be correct, the native Amboyna name being "Aylanto."

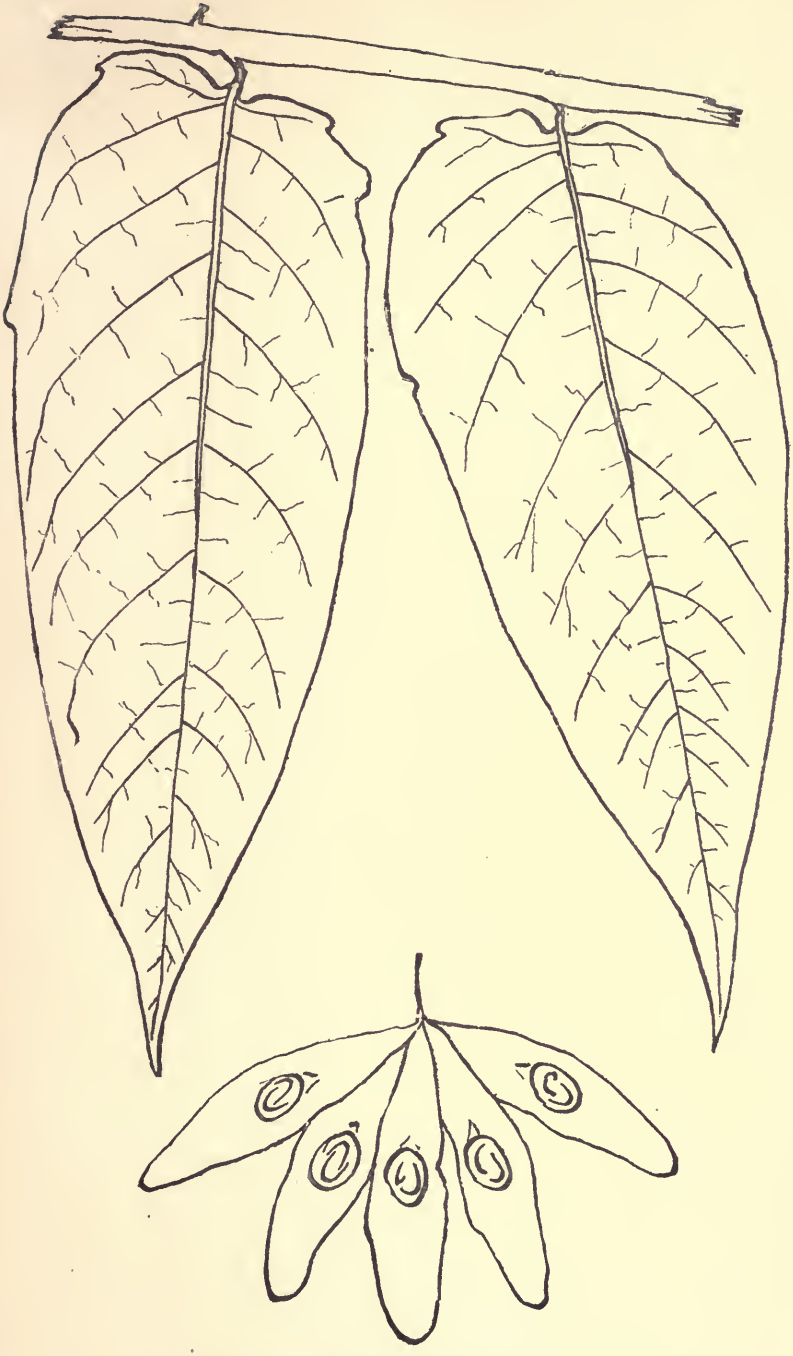

Fig. 95.—Ailànthus. [A. glandulòsa, Desf.]
NATURAL SIZE.

A large, showy tree (sixty to seventy feet high) of remarkably vigorous and rapid growth. It is a native of China. A Jesuit missionary sent its seeds in 1751 to England. In 1784 it was brought from Europe to the United States, and started near Philadelphia. Also about 1804 it was brought to Rhode Island from South America. But the source of most of the trees now found abundantly in the region of New York is Flushing, Long Island, where it was introduced in 1820. It has been a great favorite, and would deserve to be so still were it not for the peculiar and disagreeable odor of its flowers.

Genus ROBÌNIA, L. (Locust.)

Fig. 96.—Locust, Yellow Locust. *R. pseudacàcia, L.*

Leaves, COMPOUND (odd-feathered; leaflets, eleven to twenty-five); ALTERNATE; EDGE ENTIRE.

Outline, oval or egg-shape. *Apex*, rounded. *Base*, rounded.

Stem of leaf, smooth, and covering the leaf-bud of the next year.

Leaflets, very smooth, thin, often slightly tipped with the end of the mid-rib.

Bark of trunk, dark, rough, and very deeply ridged. The smaller branches and young trunks are armed with strong, triangular prickles, but these disappear when the parts are three to four inches thick.

Flowers, showy and abundant; in long, loose clusters drooping from the sides of the branchlets; white; and very fragrant. May, June.

Fruit, a smooth and rather blunt pod, two to three inches long, one and a half inches wide, four- to six-seeded. Seeds, dark brown. September.

Fig. 96.—Locust. (R. pseudacàcia, L.)
NATURAL SIZE.

Found. Native in the Alleghany Mountains from Pennsylvania (Monroe County—Porter) to Georgia; but now very generally naturalized throughout the United States east of the Rocky Mountains.

A tree usually forty to fifty feet high, sometimes ninety feet, and of rapid growth. Its wood is exceedingly hard and strong, and remarkably durable when in contact with the ground. It is used largely for posts, in ship-building, and in turnery, and it is preferred to all other native wood for treenails. It is one of the most valuable trees of this or of any country. But its cultivation as a timber tree, which at one time was very general, has nearly ceased in the United States on account of the constant damage done by the grub of the Painted Clytus (Clytus pictus). This troublesome borer not only injures the new growth, but also pierces and detaches large branches, leaving the tree ragged and stunted.

Clammy Locust. *R. viscòsa, Vent.*

This species is native to the high ranges of the southern Alleghany Mountains, but is now very widely cultivated and sometimes naturalized in the Atlantic States.

It differs from the common locust especially in its *smaller size*, in having its *leaf-stem and branchlets "sticky"* and slightly rough, and its *flowers* rose-tinted and scarcely fragrant, and in close and erect bunches.

Genus GYMNÒCLADUS, Lam. (Coffee Tree.)

Fig. 97.—Kentucky Coffee Tree, Stump Tree. *G. dioicus (L.), Koch. G. Canadènsis, Lam.*

Leaves, UNEQUALLY TWICE-COMPOUND (odd-feathered; leaflets very numerous—seven to thirteen on the different branches of the main leaf-stem); ALTERNATE; EDGE OF LEAFLETS ENTIRE.

Fig. 97.—Kentucky Coffee Tree. G. dioicus (L.), Koch.
NATURAL SIZE.

Outline of leaflets, egg-shape or oval. *Apex*, sharply taper-pointed. *Base*, slightly heart-shaped or rounded.

Leaf-stem, in the autumn takes a violet tinge.

Leaf, one and one half to three feet long, about one half as wide. *Leaflets*, one to two and one half inches long, of a dull green.

Bark of trunk, rough and scaly, separating in small and hard crosswise and backward-curled strips. Branchlets stout and not thorny.

Flowers, in white spikes along the branches. May–July.

Fruit, in large curved pods (six to ten inches long, by two inches broad), pulpy within, of a reddish-brown color, flattened and hard. Each pod contains several hard, gray seeds one half of an inch or more in diameter. September, October.

Found, in Franklin County, Pennsylvania (Porter), Western New York, westward and southward to Middle Tennessee. Not common.

A tree sixty to eighty feet high, or more, with a rather small and regular head. The fewness and the abruptness of its large branches give to it in the winter a dead and stumpy look, whence one of its common names. Its bruised and sweetened leaves are used at the South for poisoning flies. Its seeds were formerly used as a substitute for coffee.

Genus GLEDÌTSCHIA, L. (Honey Locust.)

Fig. 98.—Honey Locust, Three-thorned Acacia, Honey Shucks. *G. triacànthos, L.*

Leaves, COMPOUND; (even-feathered; leaflets, ten to twenty-two or more, usually about fourteen), sometimes twice-compound; ALTERNATE; EDGE OF LEAFLETS ENTIRE as seen above, but as seen below often remotely and slightly toothed.

Fig. 98.—Honey Locust. (G. triacànthos, L.)
NATURAL SIZE.

Outline of leaflet, long oval or long egg-shape. *Base* and narrowed *Apex*, rounded.

Leaf-stem and very short *Leaflet-stem*, downy.

Leaflets, three fourths to one and a half inches long; about one third as wide. Often several of them (one to three) are partly or wholly divided into smaller leaflets. Surfaces smooth and shining.

Bark of trunk, gray, and much less rough than that of the common Locust (which has a somewhat similar leaf); branchlets brown and often warty. The branches and the trunk, excepting in very young and in quite old trees, are usually thickly covered with *spines*, two to four inches long, which are curved at the base, often two- or three-branched, and of a reddish-brown color.

Flowers, small and greenish.

Fruit, a long, flat pod (nine to eighteen inches long), reddish; somewhat twisted, and filled between the seeds with a pulp which at first is sweet (whence the name "Honey" Locust) but which soon becomes sour. The seeds are flat, hard, and brown.

Found, native in Pennsylvania, westward and southward, but also somewhat naturalized and widely introduced northward.

A tree sometimes seventy feet high, with wide-spreading and graceful branches, and light and delicate foliage. It is often used as a hedge plant.

A variety entirely bare of thorns *(var. inèrmis)* is sometimes found; also a variety *(var. brachycàrpos)* with shorter fruit and thorns.

NOTE.—See *Poison Sumach* (R. venenàta D. C.), with its species, under D, *II.*, page 198.

TREES WITH COMPOUND LEAVES

(FEATHER-SHAPED)

LEAVES ALTERNATE

CONTINUED

(EDGE TOOTHED)

D II

Genus RHUS, L. (Sumach.)

Fig. 99.—Stag-horn Sumach. *R. typhina, L.*

Leaves, COMPOUND (odd-feathered; leaflets, eleven to thirty-one); ALTERNATE; EDGE OF LEAFLETS EVENLY AND SHARPLY TOOTHED.

Outline of leaflet, narrow egg-shape. *Apex*, long, taper-pointed. *Base*, rounded or slightly heart-shaped.

Leaflet-stem, lacking. *Leaf-stem*, *densely velvety-hairy.*

Leaflet, usually two to four inches long and about one fourth as wide; the under surface whitish and more or less downy.

Leaf, one to two feet or more in length.

Branchlets and stalks, especially towards their ends, covered with a *very dense velvet-like down*, often crimson-tinged. The juice is milky and acid.

Flowers, greenish-yellow, in upright, pyramid-shaped bunches at the ends of the branches. June.

Berries, rounded, somewhat flattened, bright crimson, velvety, crowded. *Stone*, smooth. Juice, acid. September, October.

Found, from New Brunswick and the valley of the St. Lawrence through the Northern States, and southward along the Alleghany Mountains to Central Alabama.

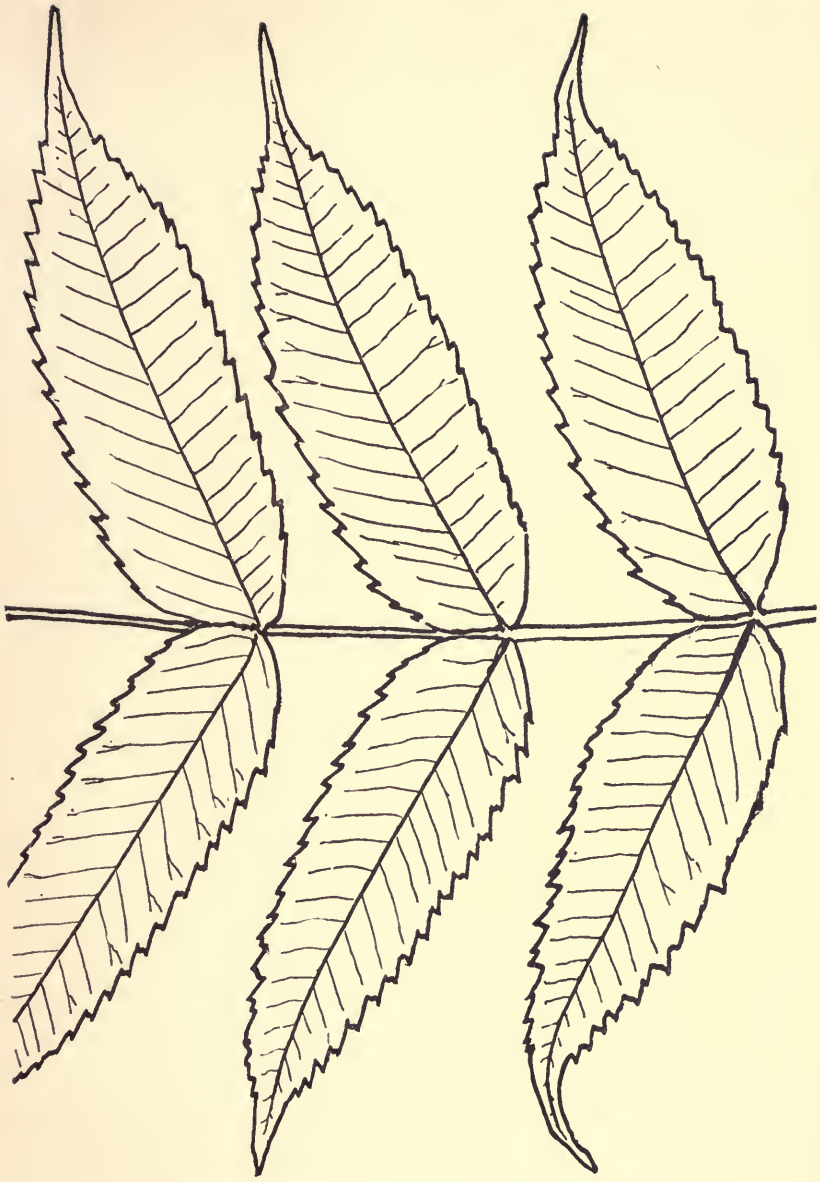

Fig. 99.—Stag-horn Sumach. (R. tỳphina, L.)
NATURAL SIZE.

A small tree, ten to thirty feet high (or often a shrub), with straggling and evenly spreading branches that are leaved mostly toward their ends, giving an umbrella-like look to the tree. The wood is very soft and brittle; yellow within; the sap-wood white. The young shoots, with the pith removed, are used in the spring as "sap quills" in drawing the sap from the sugar maples. The downy and irregular branchlets are suggestive of the horns of a stag, whence the name.

An infusion of the berries is sometimes used as a gargle for sore-throat.

This species is not poisonous.

A variety with deeply gashed leaves *(var. laciniàta)* is reported from Hanover, N. H.

Fig. 100.—Poison Sumach, Poison Dogwood, Poison Elder.
R. venenàta, D. C.

Leaves, COMPOUND (odd-feathered; leaflets, seven to thirteen); ALTERNATE; EDGE OF LEAFLETS ENTIRE.

Outline of leaflet, long oval or egg-shape. *Base*, rounded or pointed. *Apex*, taper-pointed.

Leaflet-stems, short and purplish, or lacking. *Leaf-stem*, smooth, reddish throughout to the end of leaflet, not winged.

Leaflets, thin; one and a half to three inches long; about one half as wide; smooth.

Branches and stalks, smooth.

Flowers, greenish; in long, loose bunches at the bases of the upper leaves.

Berries, rounded, greenish-white, smooth, shining, dry, about the size of a small pea. September.

Fig. 100.—Poison Sumach. (R. venenàta, D. C.)
NATURAL SIZE.

Found, from Northern New England westward and southward, oftenest in swamps.

A small tree (or more often a tall shrub), six to eighteen feet high. It is violently poisonous to the touch, causing in most persons a painful eruption ; some are poisoned by it without touching it ; probably by reason of the drifting pollen of its flowers. A recommended application is sugar of lead, applied after the use of saline cathartics ; or a thick paste of bicarbonate of soda rubbed into the skin as soon as the eruption appears. It is also claimed that relief and, if used promptly, frequent cure follow the use of belladonna, of apis mellifica, or of arsenicum album—taken in homœopathic doses.

Apart from other differences the Poison Sumach can be easily and quickly distinguished from all the other sumachs by these signs : It differs from the Stag-horn Sumach and the Smooth Sumach (a shrub) in having the edge of its leaflets entire ; from the Dwarf Sumach (a shrub) in the absence of the winged stem between its leaflets, and by its red leaf-stem.

Genus PYRUS, L. (Mountain Ash.)

(NOTE.—See others of the same genus, Sec. A, *II.*, p. 32.)

Fig. 101.—Mountain Ash. *P. Americàna, D. C.*

Leaves, COMPOUND (odd-feathered ; leaflets, nine to fifteen); ALTERNATE (often alternate in threes) ; EDGE OF LEAFLETS FINELY AND SHARPLY TOOTHED.

Outline of leaflet, long and narrow egg-shape. *Apex*, taper-pointed. *Base*, rounded or slightly pointed.

Leaflet-stem, lacking, or very short.

Fig. 101.—Mountain Ash. (P. Americàna, D. C.)
REDUCED ONE FOURTH.

Leaf, eight to twelve inches long. *Leaflet*, two to three and one half inches long; surfaces smooth.

Bark of the trunk, reddish-brown and rather smooth.

Flowers, small and white, in large, flat clusters, over the surface of the tree—fifty to one hundred or more flowers in a cluster. May, June.

Fruit, very ornamental, about the size of peas, scarlet, in large, flat clusters, ripening in autumn and remaining into the winter.

Found, from Labrador and Newfoundland through the Northern States and southward along the Alleghany Mountains. Its finest growth is on the northern shores of Lake Huron and Lake Superior.

A slender, somewhat pyramid-shaped, tree, ten to thirty feet high, much and justly prized as one of the best of the native trees for ornamental planting. Its bark and the unripe fruit are very astringent, and are sometimes used medicinally.

A slightly different species (P. sambucifòlia) is sometimes found in cold swamps and on the borders of streams, along the Northern frontier.

The cultivated *European Mountain Ash* or *Rowan Tree* [P. ancupària], which is very common in many parts of Europe, and especially in the Highlands of Scotland, differs but slightly from the American Mountain Ash. It varies chiefly in the following items: *Leaflets* blunter, and rather coarsely double-toothed. *Bark* rather rough. *Fruit* larger, oftenest red, but sometimes orange.

The Mountain Ash or "Rowan Tree" has for a long time been renowned as a safeguard against witches and all evil spirits. A mere twig of it suffices.

"Rowan-tree and red thread
Put the witches to their speed."

"The spells were vain, the hag returned
To the queen in sorrowful mood,
Crying that witches have no power
Where there is row'n-tree wood."

Genus JUGLANS, L. (Walnut.)

From two Latin words meaning nut of Jupiter.

Fig. 102.—Black Walnut. *J. nigra, L.*

Leaves, COMPOUND (odd-feathered; leaflets, thirteen to twenty-one); ALTERNATE; EDGE OF LEAFLETS SHARP-TOOTHED.

Outline of leaflet, long egg-shape. *Apex*, taper-pointed. *Base*, rounded or slightly heart-shaped, and one-sided.

Leaf-stem, slightly downy. *Leaflet-stem*, very short.

Leaf, twelve inches long, or more. *Leaflets*, about two to four inches long; the lower pairs shortest; slightly downy beneath.

Bark, blackish and thick.

Fruit, about two inches in diameter; rounded; the *husk* greenish-yellow when ripe, roughly dotted, spongy, decaying without splitting into sections; the *nut* dark, and deeply and roughly furrowed. October.

Found, from Western Massachusetts westward and southward. Its finest growth is west of the Alleghany Mountains. Eastward it is now everywhere scarce.

A tree thirty to sixty feet high, or often much higher. Its rich, dark-brown heart-wood is of great value, and has been more widely used in cabinet-work, for interior finish, and for gun-stocks than the wood of any other North American tree.

Fig. 103.—Butternut, White Walnut. *J. cinèrea, L.*

Leaves, COMPOUND (odd-feathered; leaflets, fifteen to seventeen); ALTERNATE; EDGE OF LEAFLETS SHARP-TOOTHED.

Outline of leaflet, long egg-shaped or long oval. *Apex*, taper-pointed. *Base*, rounded.

Leaf-stem, downy and "*sticky*."

Leaf, twelve to twenty inches long. *Leaflet*, three inches or more in length; downy, especially beneath.

Bark of the branches, light gray and smoothish. *Twigs*, as well as leaf-stems and fruit, very sticky.

Fruit, long (two to three inches), pointed. *Husk*, very sticky; green at first; brown when ripe, becoming very dark; not splitting in sections. *Nut*, deeply and roughly furrowed and sharp-ridged, with a sweet, oily kernel. September.

Found, in Southern Canada, and common in New England and the Middle and Western States.

A tree twenty to fifty feet high, with a short, stout trunk and very wide-reaching, horizontal branches. The heart-wood is reddish or light brown, not as dark nor as hard as in the Black Walnut. It is used for ornamental cabinet-work and interior finish.

Fig. 102

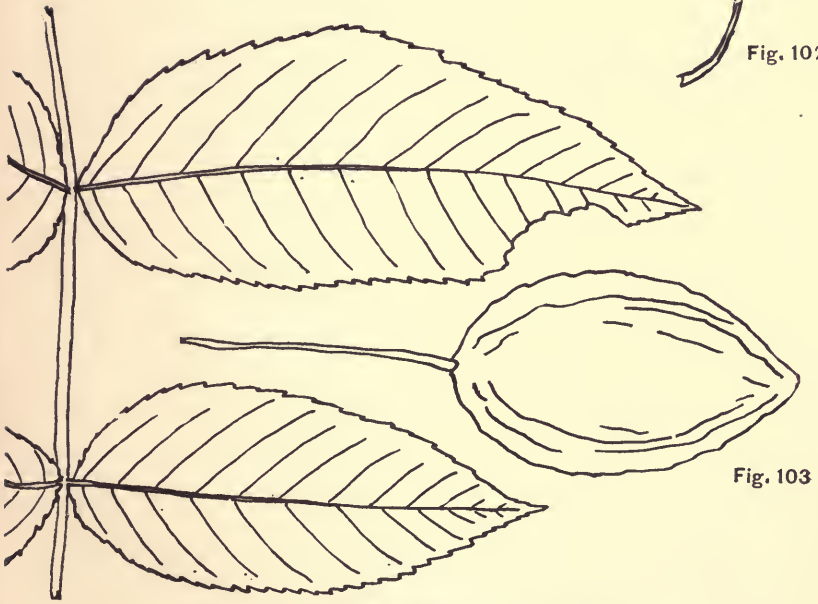

Fig. 103

Fig. 102.—Black Walnut. (J. nigra, L.)
Fig. 103.—Butternut. (J. cinèrea, L.)
LEAFLETS AND FRUIT REDUCED ONE THIRD.

Genus HICÒRIA, Raf. CÁRYA, Nutt. (Hickory.)

From a Greek word meaning round, in allusion to the shape of the nut.

Fig. 104. — Shag-bark, Shag-bark Hickory, Shell-bark Hickory. *H. ovàta (Mill), Britton. C. alba, Nutt.*

Leaves, COMPOUND (odd-feathered; leaflets, five); ALTERNATE; EDGE OF LEAFLETS SHARP-TOOTHED.

Outline of leaflet, long oval, reverse egg-shape or egg-shape, the lower pair differing in shape from the others, and much smaller. *Apex*, long-pointed. *Base* of the end leaflet, wedge-shape; of the others, more or less blunted.

Leaf-stem, rough throughout. *Buds*, large and scaly, often of a green and brown color.

Leaflet-stems, lacking (or scarcely noticeable), excepting the roughish stem of the end leaflet.

Leaflets, four to eight inches long; roughish below.

Bark, dark and very rough in the older trunks, peeling up and down in long, shaggy strips. Often the strips cling at their middle and are loose at each end.

Fruit, round, nearly one and a half to two inches in diameter; the *husk*, thick (nearly half an inch), depressed at the centre, grooved at the seams, and wholly separating into four pieces at maturity; the *nut*, about one inch long, often the same in breadth, slightly flattened at the sides, angular, nearly pointless, whitish, with a rather thin shell, and a large finely flavored kernel. October.

Found, from the valley of the St. Lawrence River to Southeastern Minnesota, and southward to Western Florida. Its finest growth is west of the Alleghany Mountains.

Fig. 104.—Shag-bark. H. ovàta (Mill), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

A tree, fifty to eighty feet high, of great value. Its tough and elastic wood is used in making agricultural implements, carriages, axe-handles, etc. It ranks also among the best of woods for fuel. Most of the "hickory nuts" of the markets are from this species.

All the Hickories are picturesque trees. Their tendency, even when standing alone, is to grow high, and with heads that, instead of being round, are cylinder-shaped to the very top, with only enough breaks and irregularities to add to the effect. This tendency is more marked in the Hickories than in any other of the leaf-shedding trees of North America. They are worthy of the name sometimes given them of "the artist's tree."

Big Shell-bark, King Nut. *H. sulcàta (Willd.), Britton. C. sulcàta, Nutt.*

This species differs from the Shag-bark chiefly in these items:

Leaflets, seven to nine, usually nine.

Leaf, ten to twenty inches long.

Nut, oval, strongly pointed, with a dark yellowish shell, nearly twice as large as the Shag-bark nut, and with a less pleasantly flavored kernel.

Bark, in narrower strips and of a lighter color.

Found, in Bucks County, Pennsylvania (Porter), and westward. Local and rare.

Fig. 105.—Mocker-nut, White-heart Hickory, Black Hickory, Big-bud Hickory. *H. alba (L.), Britton. C. tomentòsa, Nutt.*

Leaves, COMPOUND (odd-feathered, leaflets, seven to nine); ALTERNATE; EDGE SLIGHTLY AND RATHER ROUNDLY TOOTHED.

Outline of leaflets, mostly long oval, the lower pairs becoming smaller and more egg-shaped. *Apex* and *Base*, about the same as in the Shag-bark.

Fig. 105.—Mocker-nut. H. alba (L.), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

Leaf-stem, rough throughout. *Buds*, large and round and covered with downy, *yellowish-brown* scales, or, in winter, with hard and grayish-white scales.

Leaflet-stems, lacking (or scarcely noticeable), except the short, roughish stem of the end leaflet.

Leaflets, two to seven inches long, rough beneath, especially on the ribs; fragrant when crushed.

Bark, rough, becoming cracked across, but *not scaly*.

Fruit, rounded, slightly egg-shaped or oval, one and one half to two inches or more in length. The *husk* is about one fourth of an inch thick and splits nearly to the base when ripe. *Nut*, slightly six-angled, light brown, with a very thick and hard shell. The *kernel* is sweet, but small. October.

Found, common, in dry woods, especially southward and westward. It grows in Southern Canada and in all the Atlantic States. In size and in the quality of its timber the tree resembles the Shag-bark.

Fig. 106.—Small-fruited Hickory. *H. microcàrpa (Nutt), Britton C. microcàrpa, Nutt.*

Leaves, COMPOUND (odd-feathered; leaflets, five to seven, oftenest five); ALTERNATE; EDGE OF LEAFLETS SHARP-TOOTHED.

Outline of leaflets, mostly long oval. *Apex* and *Base* pointed.

Leaf-stem, smooth.

Leaflet-stems, lacking (or scarcely noticeable), excepting the short stem of the end leaflet.

Leaflets, mostly four to eight inches long, remarkably *smooth*, excepting that the under surface is tufted in the angles of the ribs and usually dotted with dark glandular spots.

Bark, rough and close.

Fruit, broad egg-shape. *Husk*, thin, splitting part way to the base. *Nut*, *small*, (three fourths of an inch in

Fig. 106.—Small-fruited Hickory. H. microcàrpa (Nutt), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

diameter), not angled, not sharp-pointed, and with a thin shell.

Found, on moist ground, New York to Delaware, west to Michigan and Illinois, rarely, if ever, in New England.

In size and in the quality of its timber the tree resembles the other hickories. By its leaves the species appears to be allied with the Pig-nut; by its nuts, with the Mocker-nut.

Fig. 107, *a* and *b*.—**Pig-nut, Broom Hickory.** *H. glabra (Mill), Britton. C. glabra, Torr. C. porcina, Nutt.*

Leaves, COMPOUND (odd-feathered; leaflets, five to nine, usually seven); ALTERNATE; EDGE OF LEAFLETS SHARP-TOOTHED.

Outline of leaflets, usually long oval. *Apex*, taper-pointed. *Base* of end leaflet, wedge-shaped, of the others more or less rounded or slightly pointed.

Leaf-stem, smooth. *Leaf-buds*, egg-shape and pointed or rounded, and with their outer scales a polished-brown.

Leaflet-stems, lacking, except the smooth, very short stem of the end leaflet.

Leaflets, mostly two to five inches long (the lower ones much the smallest), *smooth* above and below.

Bark, not shaggy.

Fruit, of two forms: *a*, pear-shape, *b*, rounded. *Husks*, very thin, splitting about half-way to the base. *Nut*, about one inch in diameter; in *b* somewhat flattened at the sides and slightly hollowed above, and with the apex a sharp point. *Shell*, rather thin, smooth, hard, and bluish-gray. *Meat*, small and sweetish or slightly bitter.

Found, from Southern Maine westward and southward.

In size and in the quality of its timber the tree resembles the other hickories.

Fig. 107, *a* and *b*.—Pig-nut. H. glabra (Mill), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 108.—Bitter-nut, Swamp Hickory. *H. mìnima (Marsh), Britton. C. amara, Nutt.*

Leaves, COMPOUND (odd-feathered; leaflets, seven to eleven); ALTERNATE; EDGE OF LEAFLET SHARP-TOOTHED.

Outline of leaflet, long oval or long egg-shape. *Apex*, taper-pointed. *Base*, pointed or blunted.

Leaf-stem, rather slender, somewhat downy, and *often flattened and winged. Leaf-buds, small*, slightly rounded or (at the ends of the branchlets) pointed, and yellow.

Leaflet-stems, lacking, except the short stem of the end leaflet.

Leaflets, four to six inches long, the upper one usually short; *smooth* on both sides, or with a slight, scattered down below.

Bark, rather smooth.

Fruit, rounded or slightly egg-shaped, dark green. *Husk*, very thin and fleshy, never becoming entirely hard, with prominent *winged edges* at the seams, only two of which reach more than half-way to the base. It divides half-way down when ripe. *Nut*, barely one inch long, heart-shaped at the top, broader than long, white and smooth. *Shell*, so thin that it can be broken with the fingers. *Kernel, intensely* bitter.

Found, usually in wet grounds, though often also on rich uplands, from Southern Maine westward and southward. It reaches its finest growth in Pennsylvania and Ohio.

A rather smaller and less valuable tree than the rest of the hickories.

NOTE.—See *Honey Locust* (G. triacànthos, L.), under D, *I.*, page 192.

Fig. 108.—Bitter-nut. H. minima (Marsh), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

TREES WITH COMPOUND LEAVES

(FEATHER-SHAPED)

CONTINUED

LEAVES OPPOSITE

(EDGE ENTIRE OR TOOTHED)

E I, II

Genus NEGÙNDO, Moench.

Fig. 109.—Ash-leaved Maple, Box Elder. *N. aceroìdes, M.*

Leaves, COMPOUND (odd-feathered; leaflets, three, sometimes five, rarely seven); OPPOSITE; EDGE OF LEAFLET REMOTELY AND UNEQUALLY COARSE-TOOTHED.

Outline of leaflets, egg-shape or oval. *Apex*, taper-pointed. *Base*, variable and often uneven.

Leaflets, slightly rough; the *ribs* very marked.

Bark of young trunks, smoothish and yellowish-green; twigs, light green.

Flowers, small and greenish, in delicate, drooping clusters from the sides of the branches.

Fruit, large, yellowish-green, smooth, in long, loose, late-hanging clusters.

Found, North, South, and West. One of the most widely distributed of the North American trees, with its finest growth in the region of the Wabash and Cumberland rivers.

A tree twenty to thirty feet high, with spreading branches. Its wood is light and of slight value.

Fig. 109.—Ash-leaved Maple. (N. acerὸides, M.)
NATURAL SIZE.

(Genus FRÀXINUS, L. (Ash.)

From a Greek word meaning "separation," because of the ease with which the wood of the Ash can be split.

Fig. 110.—White Ash. *F. Americàna, L.*

Leaves, COMPOUND (odd-feathered; leaflets, seven to nine); OPPOSITE; EDGE OF LEAFLETS SLIGHTLY TOOTHED OR ENTIRE; entire at the base.

Outline of leaflet, long oval or long egg-shape. *Apex*, taper-pointed. *Base*, somewhat pointed.

Leaf-stem, smooth. *Leaflet-stem*, about one fourth of an inch long, or more; smooth. *Leaf-bud*, rusty-colored and smooth.

Leaflet, two to six inches long; pale beneath; downy when young, but becoming nearly smooth, except on the ribs.

Bark of the trunk, light gray. In very young trees it is nearly smooth, but it soon becomes deeply furrowed—the furrows crossing each other, and so breaking the bark into irregular, somewhat square or lozenge-shaped plates. Then in very old trees it becomes smooth again, from the scaling off of the plates. The branches are smooth and grayish-green. The young shoots have a polished, deep-green bark, marked with white lines or dots.

Winged seeds, one and a half to two inches long, with the "wing" about one fourth of an inch wide, hanging in loose clusters from slender stems. The base of the seed is pointed and not winged.

Found, in rich woods, from Southern Canada to Northern Florida and westward. It is most common in the Northern States. The finest specimens are seen in the bottom lands of the lower Ohio River basin.

Fig. 110.—White Ash. (F. Americàna, L.)
LEAF AND FRUIT REDUCED ONE THIRD.

A tree forty to eighty feet high. Often the trunk rises forty feet without branching. Its tough and elastic timber is of very great value, being widely used in the manufacture of agricultural implements, for oars, and the shafts of carriages, and in cabinet-work.

I find in the notes of an old copy of White's "Natural History of Selborne" this comment: "The Ash, I think, has been termed by Gilpin the Venus of British trees."

Gerardes' "Herbal" comments: "The leaves of the Ash are of so great a vertue against serpents, as that the serpents dare not be so bolde as to touch the morning and evening shadowes of the tree, but shunneth them afarre off, as Pliny reporteth in his 16 book, 13 chap. He also affirmeth that the serpent being penned in with boughes laide rounde about, will sooner run into the fire, if any be there, than come neere to the boughes of the Ash."

In Scandinavian mythology the great and sacred tree, Yggdrasil, the greatest and most sacred of all trees, which binds together heaven and earth and hell, is an Ash. Its roots spread over the whole earth. Its branches reach above the heavens. Underneath lies a serpent; above is an eagle; a squirrel runs up and down the trunk, trying to breed strife between them.

Fig. 111.—Red Ash. *F. pubèscens, Lam.*

Leaves, COMPOUND (odd-feathered; leaflets, seven to nine); EDGE OF LEAFLETS NEARLY ENTIRE OR SLIGHTLY TOOTHED.

Outline of leaflet, long oval or egg-shape. *Apex*, taper-pointed. *Base*, somewhat pointed.

Fig. 111.—Red Ash. (F. pubèscens, Lam.)
LEAF AND FRUIT REDUCED ONE THIRD.

Leaf-stem, velvety-downy. Leaflet-stem, about one fourth of an inch long, or somewhat less, and *velvety-downy. Leaf-bud*, rounded, nearly concealed by the leaf-stem, downy, and of a dark, rusty brown.

Leaflet, two to six inches long, *downy beneath*, and pale, becoming reddish.

Bark of the trunk, *dark* ashy or granite-gray, or of a deep brown. It is slightly furrowed up and down, the furrows seldom joining or crossing. The branches are grayish. The young shoots are *velvety*, with a grayish or rusty down.

Winged seeds, resembling those of the White Ash, but usually with the end of the wing more rounded.

Found, along borders of streams and in low and swampy ground—New Brunswick to Minnesota, and southward to Northern Florida and Alabama; but rare west of the Alleghany Mountains. Its finest growth is in the Northern Atlantic States.

A medium-sized tree, usually thirty to fifty feet high, of less value than the White Ash.

Fig. 112.—Green Ash. *F. viridis, Michx., f.*

Leaves, COMPOUND (odd-feathered; leaflets, five to nine); OPPOSITE; EDGE OF LEAFLETS USUALLY SHARP-TOOTHED, but with the base entire.

Outline of leaflet, egg-shape or oval. *Apex*, taper-pointed. *Base*, pointed, often wedge-shaped.

Leaf-stem, smooth. *Leaflet-stem*, about one fourth of an inch long; smooth. *Leaf-bud*, grayish-brown and smooth.

Fig. 112.—Green Ash. (F. viridis, Michx., f.)
LEAF AND FRUIT REDUCED ONE THIRD.

Leaflet, green, and of nearly the same shade on each side; not shining, but smooth throughout, excepting that sometimes it is slightly downy in the angles of the ribs.

Bark of the branches, grayish-brown and smooth.

Winged seeds, smaller than those of the White Ash, but with the wing about the same length.

Found, in New England, but mostly southward and westward.

A tree twenty to thirty feet high, of inferior value.

Fig. 113.—Blue Ash. *F. quadrangulàta, Michx.*

Leaves, COMPOUND (odd-feathered; leaflets, five to nine); OPPOSITE; EDGE OF LEAFLETS SHARPLY TOOTHED.

Outline of leaflet, oval to long egg-shape. *Apex*, taper-pointed. *Base*, pointed.

Leaflet-stem, very short. *Leaf-bud*, velvety.

Leaflet, three to four inches long, both sides green; downy beneath.

Bark of the trunk cracks and separates in thin plates, like that of the White Oak. Branchlets smooth and square, or margined when young, becoming nearly round.

Winged seeds, about one and a half inches long, one fourth to one half of an inch wide; blunt, and of nearly the same width at both ends, and with the apex *often notched.*

Found, usually on limestone hills, from Southern Michigan to Central Minnesota, southward to Northeastern Kansas.

A tree sixty to eighty feet high, used for flooring, carriage building, etc. Its inner bark furnishes a blue dye.

Fig. 113.—Blue Ash. (F. quadrangulàta, Michx.)
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 114.—Black Ash, Water Ash, Hoop Ash. *F. sambucifòlia. Lam.*

Leaves, COMPOUND (odd-feathered; leaflets, seven to eleven, usually nine); OPPOSITE; EDGE OF LEAFLET TOOTHED.

Outline of leaflet, narrow, long oval or long egg-shape. *Apex*, taper-pointed. *Base*, rounded.

Leaf-stem, smooth, somewhat flattened or channelled, and with *sharp edges* above the leaflets.

Leaflet-stem, lacking.

Leaf-bud, deep blue or *blackish.*

Leaflet, three to five inches long, smooth and green on both sides, excepting where it is slightly hairy along the lower part of the middle rib. When crushed it has an Elder-like odor.

Bark of trunk, dark granite-gray, somewhat furrowed and broken up and down with roughnesses, which continue in the old tree. The young branches are smooth and grayish and marked with black and white dots and warts.

Winged *seeds* nearly one and one half inches long, with the wing three eighths of an inch wide and *extending around the seed.* Ripe in July.

Found, along low river-banks and in swamps, which it sometimes fills; in Delaware, the mountains of Virginia, Northwestern Arkansas, through the Northern States to Canada. It is the most Northern of the American Ashes.

Usually a small or medium-sized tree. The wood is largely used for barrel-hoops, baskets, in cabinet-work, and interior finish.

Fig. 114.—Black Ash. (F. sambucifòlia, Lam.)
LEAF AND FRUIT REDUCED ONE THIRD.

TREES WITH COMPOUND LEAVES

(HAND-SHAPED)

LEAVES OPPOSITE

(EDGE TOOTHED)

F 1

Genus ÆSCULUS, L. (Buckeye, Horse Chestnut.)

Fig. 115.—Sweet Buckeye, Big Buckeye. *Æ. flava, Ait.*

Leaves, COMPOUND (hand-shaped; leaflets, usually five, sometimes seven); OPPOSITE; EDGE TOOTHED.

Outline of leaflet, long oval, long egg-shape, or long reverse egg-shape. *Apex*, taper-pointed. *Base*, pointed.

Leaflet, four to nine inches long, one to three inches wide, usually minutely downy beneath.

Flowers, pale yellow. April, May.

Fruit, two to two and one half inches in diameter, rounded. *Husk, not prickly*, but uneven. *Nut*, one or two in a husk, large and brown.

Found, from Alleghany County, Pennsylvania, southward along the Alleghany Mountains to Northern Georgia and Alabama, and westward.

A tree thirty to seventy feet high. Its wood is light and hard to split. With the other species of the same genus it is preferred, above any other American wood, for the making of artificial limbs.

Fig. 115.—Sweet Buckeye. (Æ. flava, Ait.)
REDUCED ONE THIRD.

Fig. 116.—Ohio Buckeye, Fetid Buckeye. *Æ. glabra, Willd. Æ. Ohioènsis, Michaux.*

Leaves, COMPOUND (hand-shaped; leaflets, five); OPPOSITE; EDGE TOOTHED.

Outline of leaflet, oval or long oval. *Apex*, taper-pointed. *Base*, pointed.

Leaflets, three to seven inches long; one and a half to three inches wide.

Bark, with a disagreeable odor.

Flowers, small, yellowish-white. June.

Fruit, about three fourths of an inch in diameter. *Husk*, *prickly* when young. *Nut*, smooth.

Found, along the western slopes of the Alleghany Mountains—Pennsylvania to Northern Alabama and westward.

A small, ill-scented tree (eighteen to thirty-five feet high), with wood in quality and use much like that of the Sweet Buckeye.

Horse Chestnut. [*Æ. Hippocàstanum, L.*]

A very common introduced and cultivated species, native in Northern India.

Leaflets, five to seven (usually seven), with ribs straight, and brown-woolly when young.

Flowers, at the ends of the branches; large; in large, upright, pyramid-shaped clusters; cream-white, spotted with yellow and purple. May, June.

Fruit, large. *Husk*, with stiff prickles. *Nut*, mahogany-colored, with a large, round, whitish scar; bitter, and said to be somewhat poisonous.

A compact, rounded tree, of medium size; very ornamental when in flower. Its bark has been used as a substitute for cinchona bark in the treatment of intermittent fevers.

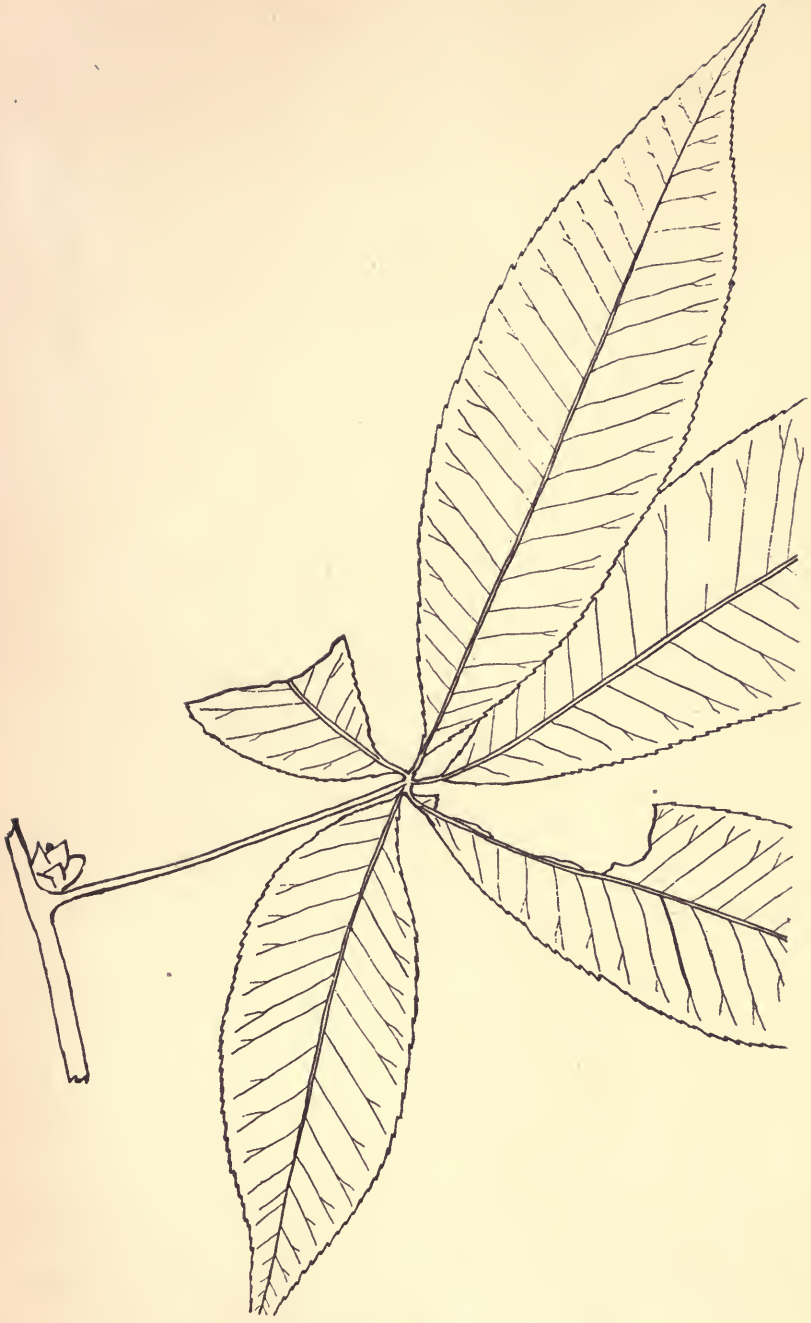

Fig. 116.—Ohio Buckeye. (Æ. glabra, Willd.)
REDUCED ONE THIRD.

I tarried there that day ; I worshipped there,—
For in that forest God seemed everywhere.
And when the shining day was wholly done
And twilight's peaceful hours were well begun,
I homeward bore the forest's loving words
That filled my heart like melodies of birds
And seemed God's benediction from above,—
Those woodland gladsome messages of love.

—From *The Trees.*

EXPLANATION OF TERMS

EXPLANATION OF TERMS.

I.

TREES, as distinguished from shrubs, are those species which, as the rule, spring from the ground with a single, branching trunk.

II.

A LEAF is :

(1) *Simple*, when it is of one piece. (Fig. *a*, Willow Oak.)

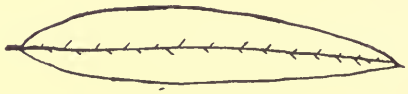

FIG. *a*.

(2) *Compound*, when there are two or more entirely separate pieces (called *leaflets*) on the one leaf-stem. (Figs. *b* and *c*, Dwarf Sumach and Horse Chestnut.) See note 2.

COMPOUND LEAVES are :

(1) *Feather-shaped*, when the leaflets are placed along the sides of the leaf-stem. (Fig. *b*.)

(When the compound leaf ends with a pair of leaflets it is *even-feathered;* when it ends with one leaflet it is *odd-feathered*.)

(2) *Hand-shaped*, when all the leaflets radiate from the end of the leaf-stem, like fingers from the palm of the hand. (Fig. *c*.)

NOTE 1.—Compound leaves may be once, twice, or three times compound.

NOTE 2.—The leaflets of a compound leaf can be distinguished from a simple leaf by the absence of leaf-buds from the base of their stems.

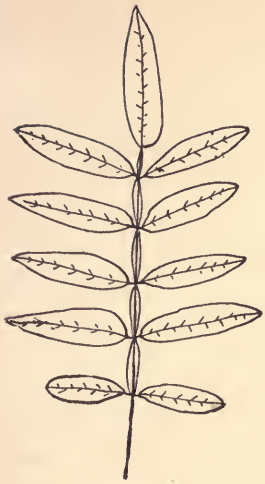

FIG. *b*.

FIG. *c*.

III.

The EDGE of the leaf is:

(1) *Entire*, when it is an even line, without indentations.

(2) *Toothed*, when it is set with an indefinite number of sharp or blunt teeth. (Fig. *d*.)

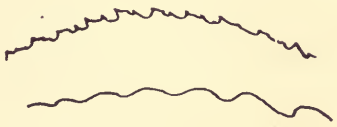

FIG. *d*.

(3) *Lobed*, when the indentations are deep and of a definite number. (Figs. *e*, *f*, and *g*, Oaks and Poplar.)

IV.

THE SHAPE OF THE WHOLE LEAF.—The leaf is:

(1) *Needle- or line-shaped*, when it is very narrow (sometimes no more than a line), and of about the same width throughout. (Fig. *h*, Pine.)

FIG. *e.*

FIG. *f.*

FIG. *g.*

(2) *Lance-shaped*, when it is much longer than wide, and gradually tapering to a point. (Fig. *i*, Willow.)

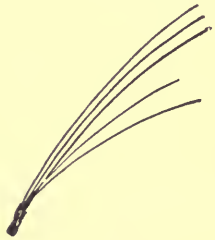

FIG. *h.*

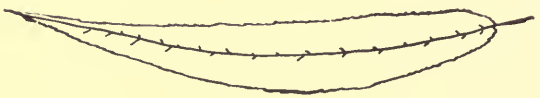

FIG. *i.*

(3) *Inversely lance-shaped*, when gradually tapering down instead of up.

(4) *Egg-shaped*, when it is the shape of an egg, with the broadest part below the middle, but without regard to the base and apex. (Fig. *j*, Dogwood.)

(5) *Inversely egg-shaped*, when it is the shape of an egg, but with the broadest part above the middle.

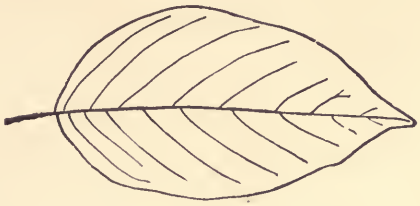

FIG. *j*.

(6) *Oval*, when shaped much like an egg, but with the broadest part at the middle. (Fig. *k*, Beech.)

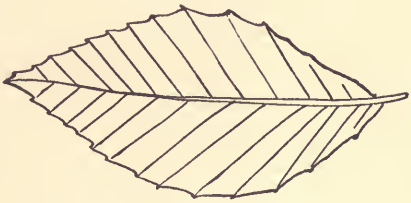

FIG. *k*.

(7) *Rounded*, when round or nearly so.

NOTE.—If the leaf is lobed its "shape" is found by filling out the space between the lobes.

V.

The APEX of the leaf is :

(1) *Pointed*. (Fig. *l*.)

(2) *Taper-pointed*, when the leaf *gradually* tapers to a point. (Fig. *m*.)

(3) *Bristle-pointed*, when it terminates with a bristle. (Fig. *n*.)

FIG. *l*.

FIG. *m*.

FIG. *n*.

(4) *Scythe-shaped*, when the tapering end curves like a scythe. (Fig. *o*.)

(5) *Blunt*, or *rounded*, when the end is evenly curved. (Fig. *p*.)

(6) *Hollowed*, when the end is more or less hollowed or notched. (Fig. *q*.)

Fig. *o*.

Fig. *p*.

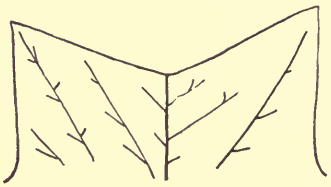

Fig. *q*.

VI.

The Base of the leaf is :

(1) *Squared*, when it is cut nearly or quite straight across. (Fig. *r*.)

(2) *Rounded*. (Fig. *s*.)

(3) *Pointed*. (Fig. *t*.)

(4) *Wedge-shaped*, when it tapers to a point by straight lines. (Fig. *u*.)

(5) *Heart-shaped*, when the edge is turned in at the base, forming a notch or bend. (Fig. *v*.)

Fig. *r*.

Fig. *s*.

Fig. *t*.

Fig. *u*.

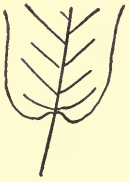

Fig. *v*.

VII.

Arrangement of Leaves on the Branch.—Leaves are :

(1) *Alternate*, when they follow one another upon different sides of the branch. (Elm, Walnut.)

(2) *Opposite*, when they are in pairs, and upon opposite sides of the branch. (Maple, Ash.)

(3) *Indeterminate*, when they are closely crowded, either in bunches (Pine, Larch), or singly up and down the branches. (Spruce, Arbor Vitæ.)

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Beech
black maple
sugar "
silver "
basswood
white pine
horse chestnut
chestnut
elm
copper beech
[illegible] tree
tulip "
larch
butterwood
hickory nut
oak
white birch
Norway Spruce
White Spruce
Mountain weeping Ash
English Maple

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